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The Canadian
Medical Association Journal

Vol. XIII TORONTO, MAY, 1923 No. 5

CANADIAN MEDICAL ASSOCIATION

Annual Meeting, Montreal—June 12th, 13th and 14th, 1923

PRELIMINARY PROGRAMME

HEADQUARTERS

Mount Royal Hotel, Montreal.

HOTEL ACCOMMODATION

Arrangements have been made with the different hotels to secure accommodation for members of the Association at the following terms:

Mount Royal Hotel

Single room with bath	$3.50 and upwards
" " " shower	4.00 to 5.00
Double " " bath	6.00 and upwards
" " " shower	6.00 to 7.00

Ritz-Carlton Hotel

Single room without bath	$3.50
" " with "	5.00 to 7.00
Double " " "	8.00 to 10.00

Windsor Hotel

Single room without bath	$2.50 and upwards
Double " " "	4.00
Single " with "	3.00 " "
Double " " "	5.00 " "

Queen's Hotel

Single room without bath	$2.50 and upwards
" " with "	3.00 " "
Double " without "	4.00 " "
" " with "	5.00 " "

For *American Plan*, the rates are doubled.

Place Viger Hotel

Single room without bath	$2.50 and upwards
" " with "	3.50 " "
Double " without "	4.00 " "
Double " with "	7.00 " "
Extra person, additional	2.00 a day

All members are notified to engage rooms from, and to make all arrangements directly with, the Management of the Hotel. All further enquiries as to accommodation may be addressed to the Chairman of the Accommodation Committee—Dr. W. G. Reilly, Drummond Apartments.

TRANSPORTATION

The ordinary Convention Certificate Rates of one fare and a half will be issued to all members of the Association coming from points East of Port Arthur. The date of departure will commence on the 7th June and the tickets will be good for return up till midnight of the 20th June.

To those coming from points West of Port Arthur an extension of time will be afforded. Attention is drawn, however, to the fact that for all members coming from the Far West, it will be more profitable to purchase a "Tourist's Ticket" inasmuch as the rates are cheaper than those issued on the certificate plan.

The Railway Authorities suggest that intending visitors should in any case consult the Local Agent with reference to this alternative.

Railway certificates will be issued in the Registration Room.

REGISTRATION

The registration of members will take place on TUESDAY, the 12th, at 9 o'clock. The registration rooms are in the centre of the Large Hall on the 9th floor, all of which has been reserved for the Association. Members are requested to register promptly.

Montreal members are urged to register on MONDAY, the day before the Meeting, in order to facilitate the work of the Committee.

(N.B.—Railway certificates will be issued in the Registration Room.) (Arrangements for ladies—see below.)

BADGES

Buttons for members, and ribbons for ladies will be issued upon registration.

EXHIBITS

All commercial exhibits will be found on the 9th floor in the Main Registration Hall. This Hall, which is 170 x 50 ft., is lighted on three sides and is undoubtedly the finest Hall of its kind in Canada.

XUM

Spaces are available for about fifty exhibits, and nearly all the room has been acquired.

The exhibits will be arranged by the Committee to accommodate the visitors in every way possible.

All exhibitors will be invited to attend a joint meeting with the Executive Committee of the Canadian Medical Association, so that every satisfaction may be afforded to all.

RECEPTION COMMITTEE

Arrangements have been made for the reception of all special guests, and the Committee will make every effort to assist in the entertainment of visitors.

SERVICE BUREAU

This Bureau, which adjoins the meeting rooms, is intended to supply all information relative to the Canadian Medical Association, and is especially for the convenience of new members.

SUGGESTION BOX

For the benefit of this and future meetings a box will be placed in the Registration Room into which members are invited to place any communications relative to the activities of the Association.

ENTERTAINMENTS

Luncheons for members in the Mount Royal Hotel each day at 12.30 o'clock sharp. Tickets for the luncheons will be found in the book of tickets issued on registration. Price, $1.00.

A short address will be given by one of the guests of honour, and routine business will be transacted during each luncheon.

Tuesday Evening at 8.30.

Reception in the Ball Room of the Mount Royal Hotel.

Wednesday, 4.30 p.m.

Garden Party.

7.30 p.m.

Banquet in the Banquet Room of the Mount Royal Hotel. Tickets, $4.00.

Ladies' Banquet in the Salle Dorée. Tickets, $2.00.

Thursday, 1.00 p.m.

Luncheons at the Golf Clubs. LADIES ONLY.

Arrangements will be made for all members who wish to play golf at any of the Clubs in the vicinity of Montreal. Through the kindness of the Committees of the various Golf Clubs, these are open to all who wish to play.

For those who wish to attend the Jockey Club Races, arrangements may be made with any member of the Reception Committee.

ENTERTAINMENTS FOR LADIES

Assembling Rooms and Information Bureau, Mount Royal Hotel—Mezzanine Floor.

A Local Committee of Ladies will be present in these rooms on TUESDAY morning and afternoon from 10.00 to 4.00, and on WEDNESDAY and THURSDAY mornings from 10.00 to 11.00, to receive visiting ladies, arrange for their entertainment and to give any information.

TICKETS FOR ENTERTAINMENTS

All members will receive from the Central Registration Bureau tickets for ladies accompanying them for the following:

1. Tuesday Evening Reception.
2. Afternoon Tea or Garden Party.

Tickets for Special Ladies' Functions will be distributed in the Ladies' Committee Room for:

1. Ladies' Banquet—Wednesday Evening.
2. Golf Club Luncheons—Thursday.

Ladies wishing to play golf will apply at the Ladies' Committee Room.

3. Thursday, 12 noon

By special invitation of the Harbour Commissioners of Montreal, the visiting ladies will be entertained on board the Commissioners' tug *Sir Hugh Allan* for a two hour sail through the Harbour and down river. Buffet luncheon will be served on board.

MOTORS

Motors with the green and white insignia of the Canadian Medical Association on the wind shield, are at the disposal of all visitors.

BUSINESS MEETINGS

The Executive Committee will meet on MONDAY, June 11th, at 10.00 a.m. in the Committee Room on the 9th floor of the Mount Royal Hotel. Subsequently, business will be transacted at the luncheons. The business of the meeting will be concluded immediately after the luncheon on Thursday, at 1.30 p.m. in the general meeting hall.

Tuesday Evening

The Meeting will be opened by the President of the Provincial Association—Dr Grondin.

Address of Welcome—Principal, Sir Arthur Currie.

Addresses by other distinguished visitors including Address by Dr. M. T. MacEachern on "What the Canadian Medical Association stands for."

SCIENTIFIC PROGRAMME

NOTE—General Sessions will be held in the Auditorium on the Ninth floor of the Mount Royal Hotel.

RULES:

Papers—20 minutes.
Discussion—5 minutes.
Reply—10 minutes.

Tuesday, June 12th.

9.00 a.m.—Registration.

10.30 a.m.—Discussion—Infections of the Hand.

(a) Anatomy. Lantern demonstration.

I. Maclaren Thompson,
Lecturer in Anatomy, McGill University

(b) Treatment. Lantern demonstration.

W. A. Ferguson, Moncton, N.B.

11.10 a.m.—Trauma of the Hand and Forearm.

J. A. Gunn, Winnipeg

11.30 a.m.—Disabilities of the Hand; Frequency and Economic Aspect.

D. D. MacTaggart, Montreal

11.45 a.m.—Industrial Medicine; its Motives and Merits. Lantern illustration.
B. L. Wyatt,
Director, Laurentide Health Service

12.00 noon—Adjournment.

12.30 p.m.—Official Luncheon.

2.00 p.m.—Paper—Septic Factors in the Great Plagues.
W. J. Mayo, Rochester, Minn.

2.30 p.m.—Clinic—Orthopaedic cases: Fracture of Elbow, Malunion of femur and leg, Derangement of knee joint, Potts and Colles fractures, Deformities from Infantile Paralysis, Club foot, Tuberculous joint.
Sir Robert Jones, Liverpool

4.00 p.m.—Paper—Acute Osteomyelitis. Lantern illustration.
Edward Gallie, Toronto

Discussion led by—
Alex. Gibson, Winnipeg;
A. Mackenzie Forbes, Montreal

8.30 p.m.—Reception in the Ball Room.
Chairman—*Dr. S. E. Grondin,*
President, Province of Quebec Medical Association

Address of Welcome,
Principal, *Sir Arthur Currie,*

Addresses by distinguished guests, including Dr. M. T. MacEachern, "What the Canadian Medical Association stands for."

Wednesday June 13th.

9.00 a.m. to 12.00 noon—Sectional clinics in the Hospitals.

12.30 p.m.—Official Luncheon.

2.00 p.m.—Paper—Intestinal Obstruction.
Sir Wm. Taylor, Dublin

Discussion led by—
H. A. Bruce, Toronto;
N. J. McLean, Winnipeg

2.30 p.m.—"Recent Advances in the Treatment of Organic Disease."
Myocarditis and Nephritis.
K. A. MacKenzie, Halifax

Discussion opened by—
L. M. Murray, Toronto
J. A. Oille, Toronto

Pleural Infections.
Duncan Graham, Toronto

Discussed by—
Wm. Boyd, Winnipeg

Insulin and Diabetes. Lantern illustration.
F. G. Banting, Toronto

Discussion opened by
E. H. Mason, Montreal;
I. M. Rabinowitch, Montreal

Paper—The Second Winnipeg Epidemic of Encephalitis.
Wm. Boyd, Winnipeg

7.30 p.m.—Official Banquet. Ball Room.
Ladies' Banquet. Salle Dorée.
Entertainment by Rice Brothers' selected performers.

Thursday, June 14th.

9.00 a.m. to 12.00 noon.—Sectional clinics at the Hospitals.

12.30 p.m.—Official Luncheon.

2.00 p.m.—Symposium—The Problem of More and Better Children.

1. Chairman's Introductory Remarks.
2. Sterility of the Female—Relative and Absolute. Gynaecological Aspect.
S. E. Grondin, Quebec

Curettage; its limited indications and multiple contraindications.
E. St. Jacques, Montreal

Endocrine Disorders.
George Hale, London

Radiation; its use and abuse.
L. T. Parizeau, Montreal

3. Sterility of the Male.
F. S. Patch, Montreal
4. Prenatal Care of the Mother.
Rene de Cotret, Montreal
5. Conservatism in Delivery from the Standpoint of Mother and Child.
H. M. Little, Montreal
6. Care of the New-Born.
Hereditary Syphilis.
E. A. Morgan, Toronto

The Child's Food.
Geo. A. Campbell, Ottawa

SECTIONAL and HOSPITAL PROGRAMME

EYE, EAR, NOSE AND THROAT SECTION

Tuesday, June 12th.

2.30 p.m.—Royal Victoria Hospital.
Demonstration of Clinical Cases

7.30 p.m.—Dinner at Mount Royal *Club.*

Wednesday, June 13th.

10.00 a.m.—Mount Royal *Hotel.* Ninth Floor.
Paper: 1. The Diagnostic value of Modern Perimetry in Diseases of the Visual Pathway.
Luther C. Peter, Philadelphia

2. Cerebellar abscess.
J. S. Fraser, Edinburgh

2.30 p.m.—Montreal General Hospital.
Demonstration of Clinical Cases.

Thursday, June 14th.

10.00 a.m.—Hotel Dieu.
Demonstration of Clinical Cases.

2.30 p.m.—Mount Royal Hotel.
Papers:

1. The Correction of Deformities of the Nose by Autogenous Grafts. Lantern illustration.
E. Fulton Risdon, Toronto

2. Suggestions for Refinements in Mastoid Surgery.
Edmund Boyd, Toronto

3. Thrombosis of the Lateral Sinus.
D. H. Ballon, Montreal

4. The Treatment of Tuberculosis of the Eye.
W. G. M. Byers, Montreal

5. The Treatment of Syphilis of the Eye.
F. T. Tooke, Montreal

6. Nasal Drainage in Lachrymal Disorders.
J. A. MacMillan, Montreal

7. The Ocular Malingerer.
A. G. McAuley, Montreal

8. The Slit Lamp and its Application.
J. Rosenbaum, Montreal

9. Some Eye Symptoms in Encephalitis Lethargica.
J. W. Stirling, Montreal

10. The Pathology of the Choroid (Illustrated).
S. Hanford McKee, Montreal

11. Living Case. Intracranial Aircele (Fracture of frontal bone) complicated by Wernicke Aphasia. (Sensorial).
J. P. E. Bousquet, Montreal

12. Serous Meningitis with report of case.
E. Hamilton White, Montreal

Joint Secretaries

J. P. E. Bousquet and *S. Hanford McKee*
Programme communications should be sent to
S. Hanford McKee, 158 Crescent Street, Montreal

CANADIAN SOCIETY OF ANAESTHETISTS

Third Annual Meeting

Headquarters and Sessions, Mount Royal Hotel, Mezzanine Floor

Tuesday Forenoon, June 12th.

Registration—Mount Royal Hotel.
Demonstrations—Biological Building, McGill University.
Department of Botany—Influence of Anaesthesia on Plant Growth.
Professor F. E. Lloyd

Department of Pharmacology—Demonstrations by *Professor H. J. Barbour, Professor R. L. Stehle* and *Wesley Bourne.*

Tuesday Afternoon, June 12th.

Mount Royal Hotel, Mezzanine Floor

2.00 p.m.—Presentation of Gavel—*Col. Wm. Webster*, Winnipeg.
Address of Welcome—*W. W. Chipman*, Professor of Gynaecology and Obstetrics, McGill University.

Minutes of Previous Meeting.
Treasurer's Report.
Election of New Members.
Election of Officers for 1923-4.
Following nominations already made:
Walter L. Muir, Halifax, N.S.—*President.*
J. J. Buettner, Syracuse, N.Y.—*Vice-President.*
F. H. McMechan, Avon Lake, Ohio
Executive Officer for U.S.A.
H. E. G. Boyle, London Eng.
Executive Officer for Great Britain.
H. J. Shields, Toronto—*Secretary-Treasurer.*

EXECUTIVE COMMITTEE:

Ernest B. Convery—Quebec, P.Q.
David D. Freeze—Vancouver, B.C.
J. E. Racicot—Montreal.
George C. Van Wart—Fredericton, N.B.

President's Address:
David H. Arnott, London, Ont.

The Effects of Ether Anaesthesia on Afferent Paths in Decerebrate Animals.
Alexander Forbes and *R. H. Miller*,
Department of Physiology, Harvard Medical School.

The Influence of Pain and its Allies upon the Cells of the Cerebral Cortex.
G. S. Foster, Manchester, N.H.

Certain Experimental and Clinical Observations in Ether Anaesthesia.
T. K. Kruse,

Department of Pharmacology, University of Pittsburg.

Blood Effects after Ether Anaesthesia and Transfusion.
E. C. Levine, Montreal

Shock Prophylaxis.
C. J. Wells, Syracuse, N.Y.

Tuesday Evening, June 12th.

Annual Dinner at the Mount Royal Hotel.

Wednesday Forenoon, June 13th.

Anaesthesia Clinics at the Following Hospitals:
Hotel Dieu.
Montreal General.
Notre Dame.
Royal Victoria.
Montreal Maternity.
Montreal Western.
Arranged by the Anaesthetists of the various Institutions and for which Bulletins will be issued on the previous day.

Wednesday Afternoon, June 13th.

2.00 p.m.—Mount Royal Hotel, Mezzanine Floor.
On the Impurities occurring in Anaesthetic Ether.
Professor Allan W. Rowe, Boston

Further Studies on the Pharmacological effects of Impurities in Anaesthetic Ether.
Professor W. L. Mendenhall, Boston

A Case of Fatty Degeneration of the Liver following Ether Anaesthesia.
W. B. Howell, Montreal

Postoperative Pulmonary Complications.
W. Pickles and *C. O. Cooke*, Providence, R.I.

Psychology, its relation to the Anaesthetist.
J. J. Buettner, Syracuse, N.Y.

Gas-Oxygen, the theory *versus* the practice.
W. Easson Brown, Toronto

Wednesday Evening, June 13th.

Banquet jointly with the Canadian Medical Association.

Thursday Forenoon, June 14th.

Anaesthesia Clinics at the various Hospitals as on Wednesday Forenoon.

Thursday Afternoon, June 14th.

2.00 p.m.—Mount Royal Hotel.
Observations on some Reflex Effects of Ether Anaesthesia.
Professor M. S. Dooley, Syracuse, N.Y.

Reflex Rigidity under Anaesthesia.
A. E. Guedel and *Karl Ruddell*, Indianapolis

Preliminary Medication.
Robert Hammond, New York

New Trends in Anaesthesia.
F. H. McMechan, Avon Lake, Ohio

The Anaesthesia Problem in Exophthalmic Goitre.
Don A. Warren, Hamilton, Ont.

Preoperative Digitalization.
Everett Tyler, Philadelphia

Office of the Secretary, 34 St. Mark Street, Montreal.

THE CANADIAN RADIOLOGICAL SOCIETY

Fourth Annual Convention in conjunction with the

Canadian Medical Association, Montreal, June 12th, 13th, 14th, 1923

Mount Royal Hotel, -- Mezzanine of Ninth Floor.

PRELIMINARY PROGRAMME

To date, the following papers have been promised:

Dr. W. H. Dixon, Toronto—Subject: gastro intestinal.

Dr. G. E. Richards, Toronto—"Deep therapy in Cancer."

Dr. Tovell, Toronto—"Primary Lung Growths."

Dr. H. H. McIntosh, Vancouver—(Title later).

Dr. A. W. George, Boston—(Title later).

Dr. Chas. G. Sutherland, Mayo clinic, Rochester—(A Study of 7,000 roentgenologic examinations of the stomach).

Dr. A. E. Walkey—"Multiple Myeloma."

Dr. W. H. McGriffen—"Carcinoma of the Colon."

Dr. Walter Wilkins, Montreal—"Superficial X-ray Therapy."

Dr. Cheney, Montreal—"Measurement of X-ray in deep therapy and superficial therapy."

Dr. Leo Pariseau, Montreal—"Physics of Deep X-ray therapy and of Radium."

Dr. Howard Pirie, Montreal—"Failures in deep therapy and contraindications for its use."

Dr. Brooks, Montreal—"Success in deep X-ray therapy."

XUM

SCIENTIFIC EXHIBITS

A large dark room has been set aside for the display of plates, slides, apparatus. All those wishing to exhibit will please communicate with Dr. H. Pirie, Royal Victoria Hospital (Montreal), so that he may provide the necessary viewing-boxes and tables.

THE RADIUM INSTITUTE

Arrangements are being made for a special visit to the new Radium Institute endowed by the provincial government and installed at the University of Montreal. *One gram* of Radium is available for the production of emanation and an additional quarter gram for research work and special cases.

The apparatus for the production of emanation is probably the most elaborate in America.

X-RAY CLINICS IN HOSPITALS

The principal hospitals of the city are wide open all week. Every one of the local radiologists has promised to collect such cases as will demonstrate completely some particular technique.

COMMERCIAL EXHIBITS

Manufacturers of X-ray and electromedical apparatus have secured space in the exhibition hall of the Canadian Medical Association Convention. The latest types of instruments and accessories will be on view.

ACCOMMODATION, ETC.

For particulars on transportation, hotels and registration, please consult the programme of the Canadian Medical Association. Official correspondence should be addressed to the President of the Society, Dr. L. J. Carter, Brandon, Manitoba. Any information needed will be gladly furnished by the Chairman of the local committee:

Dr. Leo E. Pariseau, X-Ray Department,
Hotel Dieu, Montreal.

HOSPITAL CLINICAL WEEK, JUNE 11th to JUNE 16th

NOTRE DAME HOSPITAL

Monday, June 11th.

Theatre No. 1

9.30 a.m.—Drs. Ethier and R. Trudeau—Gynaecology, Operative clinic.

9.30 a.m. to 12 noon:
Medical wards.
Drs. E. P. Benoit and A. Lesage—Bedside clinics and demonstrations.

Surgical wards.
Drs. O. F. Mercier, T. Parizeau and B. G. Bourgeois—Bedside clinics and demonstrations.

10.00 a.m. to 11.00 a.m.:
Dermatology and Syphilography.
Drs. G. Archambault, J. E. Toupin, A. Marin and R. Dore—Clinics and demonstrations.

Wednesday, June 13th.

Theatre No. 3

9.30 a.m.—Dr. E. P. Benoit—Blood pressure, normal and pathological physiology.

10.15 a.m.—Dr. J. A. Rouleau—Syphilis of the brain with pathological specimens.

11.00 a.m.—Dr. G. Archambault—Arsenic and bismuth therapy in the treatment of syphilis.

Theatre No. 1

9.30 a.m.—Dr. O. F. Mercier—Treatment of Fractures.

10.30 a.m.—Dr. A. Ethier—Ectopic pregnancy.

11.15 a.m.—Dr. A. Prevost—Radio-therapy in the treatment of cerebral tumours.

Theatre No. 4

9.30 a.m.—Drs. E. Dufresne, L. Blagdon and J. U. Gariepy—Demonstration of apparatus in fractures.

Medical wards.

9.30 a.m. to 12 noon—Drs. E. P. Benoit and A. Lesage—Bedside clinics and demonstrations on patients.

Department of Dermatology and Syphilography (in charge of Dr. G. Archambault).

9.30 a.m.—Dr. A. Marin—Technique of blood drawing on the adult and the nursling.

10.00 a.m.—Dr. R. Dore—Technique of lumbar puncture.

10.30 a.m.—Dr. J. R. Toupin—Technique of intravenous and intra-muscular injections (Salvarsan, neo-Salvarsan, sulfarsenol, eparseno, cyanide of mercury, etc.)

10.30 a.m.—Dr. W. Derome—Ultra-microscope and Wassermann (technique and demonstrations).

Outdoor Surgical Department.

10.00 a.m. to 12 noon—Drs. Ferron and Bellerose—Demonstrations.

Thursday, June 14th.

Theatre No. 3

9.30 a.m.—Dr. A. Lesage—Modern views on dyspepsia (prognosis and treatment).

10.30 a.m.—Dr. T. Parizeau—Treatment of ulcer and cancer of the stomach.

11.15 a.m.—Dr. A. Leger—Clinical interpretation of Ambard's test.

Theatre No. 1

9.30 a.m.—Dr. B. G. Bourgeois—Duty of the practitioner in the treatment of urological patients.

10.15 a.m.—Dr. W. Derome—Ambard's test in the appreciation of the renal function.

11.00 a.m.—Dr. N. Fournier—Treatment of different kinds of urethritis.

Theatre No. 4

9.30 a.m. to 12 noon—Drs. O. A. Demers and O. A. Gagnon—Demonstrations of treatment and apparatus in articular lesions (Pott's disease, osteo-arthritis).

Laboratory of Radio-and Radiumtherapy.

10.00 a.m.—Dr. J. E. Panneton—Indications and contra-indications of roentgen and radiumtherapy in utérine fibroids and haemorrhages.

Surgical wards.

10.00 a.m. to 12 noon—Drs. O. F. Mercier and T. Parizeau—Bedside clinics and presentation of patients.

Dispensary of Venereal Diseases.

10.00 a.m. to 12 noon—Dr. N. Fournier—Modern technique in venereology.

Friday, June 15th.

Theatres No. 1 and 2

9.30 a.m. to 12 noon—Surgical and gynaecological operations.

Dispensary of Dermatology.

9.30 a.m.—Presentation of patients.

11.00 a.m.—Dr. G. Archambault—Treatment of primary syphilis.

10.00 a.m. to 12 noon—Bedside clinics and presentation of patients—(Drs. Mercier, Benoit, Parizeau, Lesage, Ethier, Aubry, Demers and Gagnon).

Saturday, June 16th.

Theatres No. 1 and 2

9.30 a.m. to 12 noon—Surgical and gynaecological operations.

Dispensary of venereal diseases.

10.00 a.m. to 12 noon—Presentation of patients and demonstrations.

10.00 a.m. to 12 noon—Bedside clinics and presentation of patients—(Drs. Bourgeois, Trudeau, Rouleau, Leger, Dufresne, Blagdon and Gariepy).

ST. PAUL HOSPITAL

(Contagious Diseases)

Wednesday, June 13th.

9.00 a.m. to 11.00 a.m.—Bedside clinics and presentation of patients.

Dr. J. A. Leduc—Treatment of diphtheria (Serums, Schick's test, toxine-anti-toxine therapy).

Thursday, June 14th.

10.00 a.m. to 11.00 a.m.—Bedside clinics and presentation of patients.

11.00 a.m.—Dr. P. Del Vecchio—Treatment of scarlet fever.

ROYAL VICTORIA HOSPITAL

Wednesday, June 13th.

Medicine

9.00 a.m. to 10.00 a.m.—Dr. W. F. Hamilton—Theatre clinic.

10.00 a.m. to 10.45 a.m.—Dr. A. Henderson—Demonstration of protein sensitization tests.

10.45 a.m. to 11.15 a.m.:

Dr. J. Kaufmann—1. Subcutaneous administration of oxygen in measured doses.
Demonstration of apparatus.
2. A new diuretic for intramuscular administration.

11.15 a.m. to 12 noon—Dr. C. Russell—The treatment of neuro-syphilis with demonstration of lumbar puncture.

Surgery

9.00 a.m. to 10.30 a.m.—Dr. G. E. Armstrong—Theatre lecture on rotation of the colon, with lantern slides.

10.30 a.m. to 11.30 a.m.—Dr. C. B. Keenan—The plating of compound fractures.

11.30 a.m. to 12 noon—Dr. E. Levine—Demonstration of blood transfusion.

Genito-Urinary Surgery

9.00 a.m. to 10.30 a.m.:

Dr. D. Mackenzie—Theatre clinic on.
1. Kidney infections; diagnosis and treatment.
2. Prostatism; diagnosis and treatment.

Orthopaedic Surgery

10.30 a.m. to 12 noon:

Dr. W. G. Turner—1. Treatment of congenital dislocation of the hip. Results.
2. The tubercular knee. Results.

Thursday, June 14th.

Medicine—Theatre clinics

9.00 a.m. to 10.00 a.m.—Dr. E. H. Mason—The modern treatment of diabetes, including the effect of insulin on metabolism.

10.00 a.m. to 11.00 a.m.—Dr. D. S. Lewis—Treatment of nephritis.

11.00 a.m. to 12 noon—Dr. C. F. Moffatt—The treatment of cardiac failure.

Surgery

9.00 a.m. to 10.00 a.m.—Dr. E. W. Archibald—Theatre clinic on the results of extensive rib resection in the treatment of pulmonary tuberculosis.

10.30 a.m. to 12 noon—Dr. A. E. Garrow—The operative treatment of coloptosis.

Gynaecology

9.00 a.m. to 12 noon—Dr. W. W. Chipman—Theatre clinic on prolapsus uteri. The radical cure of the hernia, with case for operation.

In addition to the above Canadian Medical Association programme, on Monday, Friday, and Saturday the staffs of the various departments at the Royal Victoria Hospital will be at home to members who desire to follow their rounds. In particular the following clinics have been arranged.

Monday, June 11th.

In Medicine, Dr. W. F. Hamilton will give a ward round from 9.00 a.m. to 10.00 a.m.

In Gynaecology, Dr. H. C. Burgess will give a theatre clinic abortion on from 9.00 a.m. to 10.00 a.m.

In Surgery, Dr. G. E. Armstrong will give a theatre clinic from 10.00 a.m. to 11.00 a.m. Dr. Keenan will give ward rounds from 9.00 a.m. to 10.00 a.m., and Dr. Archibald will give ward rounds from 11.00 a.m. to 12 noon.

In Genito-urinary surgery, Dr. Mackenzie will give a ward round from 9.00 a.m. to 10.00 a.m.

Friday, June 15th.

In Gynaecology, Dr. J. R. Fraser will give a theatre clinic on the treatment of pelvic infections from 9.00 a.m. to 10.00 a.m.

In Medicine, Dr. C. F. Martin will give a theatre clinic from 10.00 a.m. to 11.00 a.m. Dr. Hardisty will give a theatre demonstration in the use of the duodenal tube for bile drainage, from 11.00 a.m. to 12 noon.

In Genito-urinary surgery, Dr. Mackenzie will give a ward round from 10.00 am. to 11.00 a.m.

In Surgery, Dr. Scrimger and Dr. McKenty will give ward rounds from 10.00 a.m. to 12 noon.

Saturday, June 16th.

In Gynaecology, Dr. W. W. Chipman will give a theatre demonstration from 10.00 a.m. to 12 noon.

In Surgery, Dr. Keenan will give a ward round from 9.00 a.m. to 10.00 a.m., and Dr. Archibald will give a ward round from 11.00 a.m. to 12 noon.

Dr. Burnett will give a dermatological clinic from 10.30 a.m. to 12 noon.

In addition to the above there will be given during the forenoon throughout the week, continuous demonstrations in the following departments:

I.—X-ray Department.
1. The massive use of x-rays in cancer therapy.
(*Dr. Pirie* and *Dr. Brooks*).
2. Exhibits of skiagrams.
(*Dr. Pirie* and *Dr. Cheney*).

II.—Demonstration of the art of medical illustration.
(*Miss Lawson*).

III.—Demonstration of electrocardiograms.
(*Dr. Moffat*).

IV.—Department of Metabolism.
1. Demonstration of routine metabolism work.
(*Dr. Walker*).

V.—Department of Pathology.
1. Demonstration of interesting pathological specimens.

VI.—Department of hydrotherapy.
The uses of mechanotherapy and hydrotherapy.
(*Dr. Brown* and *Miss Ross*).

MONTREAL MATERNITY HOSPITAL

Wednesday, June 13th.

9.00 a.m.—Dr. W. A. G. Bauld—Technique of Normal Delivery.
9.45 a.m.—Dr. H. C. Burgess—Application of Forceps.
10.30 a.m.—Dr. J. W. Duncan—Induction of Labour.
11.00 a.m.—Dr. H. M. Little—Version and Extraction.

Thursday, June 14th.

9.00 a.m.—Prenatal examination. Methods used. Demonstration-living cases-contracted pelves. Toxaemia, etc.
Dr. J. R. Fraser

10.00 a.m.—Puerpal Infection—Newer methods of Treatment.
Dr. J. R. Goodall

11.00 a.m.—Caesarean Section.
Dr. W. W. Chipman

During the week, June 11th to 16th, rounds will be made daily at 10.00 a.m., and to this will be added case room work as it presents itself.

Dr. Wesley Bourne, Anaesthetist to the Hospital, will demonstrate at the clinics, special methods (Gas and Oxygen) in Anaesthesia.

SAINT JUSTINE HOSPITAL FOR CHILDREN

Wednesday, June 13th.

MEDICAL DEPARTMENT:

1.—Achondroplasia. Presentation of a case.
Dr. R. Masson

2.—Proteintherapy in milk anaphylaxis.
Dr. Lafleur

3.—Syphilis of the new-born.
Dr. Decarie

4.—Early diagnosis of tuberculosis in children.
Dr. Desrochers

5.—Inspection of the hospital.

Thursday, June 14th.

1.—Social aid to childhood in the Province of Quebec.
Dr. Lapierre

2.—Dietary of the eczematous child.
Dr. Decarie

3.—Subcutaneous abscesses of the new-born.
Dr. Bourgoin

4.—Dietary of the bottle fed babies.
Dr. Dutilly

5.—Hospitalization of the poor.
Dr. Bernard

Wednesday, June 13th.

SURGICAL DEPARTMENT:

1.—Hare Lip. (Cleft palate; approximating the maxillae, Dr. Ferron's personal method).
Dr. Ferron

2.—Deformity of the Tibia (Rickets). (Osteotomy of the tibia and immobilization in plaster of Paris casing).
Dr. Crépault

3.—Spina Bifida. (Excision of the tumour and isolation of the nerve cords).
Dr. Dubé

4.—Hare Lip. (Restoration of the lip and nostril.
Dr. Ferron

5.—Torticollis. (Tenotomy and immobilization in plaster of Paris casing).
Dr. Rivard

Thursday, June 14th.

1.—Hypospadias (Formation of a new urethra).
Dr. Ferron

2.—Prolapse of the Rectum (Metallic ring).
Dr. Crépault

3.—Hare Lip (Cleft palate; approximating the maxillae. Dr. Ferron's personal method).
Dr. Ferron

4.—Retained Testis (Orchidopexy).
Dr. Dubé

5.—Scoliosis (Plaster corset).
Dr. Rivard

Friday, June 15th.

1.—Hare Lip. (Restoration of the lip and nostril).
Dr. Ferron

2.—Retained Testis (Orchidopexy).
Dr. Crépault

3.—Hypospadias (Formation of a new urethra; second step).
Dr. Dubé

4.—Deformity of the Femur. (Rickets). (MacEwen's supracondyloid osteotomy).
Dr. Ferron

5.—Pott's Disease (Plaster corset).
Dr. Rivard

CHILDREN'S MEMORIAL HOSPITAL

Clinics and Demonstrations will be provided for Monday, Wednesday and Thursday.
Details to be announced in Final Programme.

MONTREAL GENERAL HOSPITAL

Monday, June 11th.

Medicine

10.00 a.m. to 12.00—Ward Rounds.
C. A. Peters
A. H. Gordon

9.30 a.m. to 12.00—Metabolic Laboratory.
I. M. Rabinowitch

11.00 a.m. to 1.00 p.m. Outdoor Clinic.
A. A. Robertson

11.00 a.m. to 12.30—Dermatological Clinic.
G. G. Campbell

Surgery

9.30 a.m. to 12.00—Operative clinics
Drs. Hutchison, Barlow, Tees and *Johnson*

11.00 a.m. to 1.00 p.m. Outdoor clinic.
F. B. Gurd

1.00 p.m. Operative clinics.
Drs. Bazin, Eberts, Henry, Pennoyer and *Gurd*

Wednesday, June 13th.

Medicine

9.30 a.m. Pediatrics—Selected cases.
A. B. Chandler

10.00 a.m. Medical clinic.
F. G. Finley
H. A. Lafleur

10.30 a.m. Myxoedema with Pericardial Effusion.
C. A. Peters

11.00 a.m. Dermatology—Selected cases—Lantern Demonstration.
G. G. Campbell

11.30 a.m. Diabetes.
I. M. Rabinowitch

Surgery

9.00 a.m. (a) Drainage of the abdomen, Indications and Contra-indications, Methods and Material.
A. T. Bazin

Discussed by W. J. Mayo and others.

(b) Direct Inguinal Hernia—Plastic Repair—End results.
A. T. Bazin

10.00 a.m. Urology
F. S. Patch

10.30 a.m. Orthopaedics — Claw Foot — Operative Treatment
J. A. Nutter

11.00 a.m. Gynaecology—Hysterectomy.
F. A. Lockhart

Thursday, June 14th.

Medicine

9.30 a.m. Clinic—Pathological Conference.
L. J. Rhea and Clinicians

10.30 a.m. Acute Yellow Atrophy of Liver.
A. H. Gordon

11.00 a.m. Encephalitis lethargica.
F. H. Mackay

11.30 a.m. Heart Studies. Electrocardiagram.
C. C. Birchard

Surgery

9.30 a.m. Thyroidectomy.
E. M. Eberts

10.00 a.m. Pancreatitis.
W. L. Barlow

10.30 a.m. Estlander operation.
J. Alex. Hutchison
Chronic Empyema.
F. B. Gurd

11.00 a.m. Chronic Pelvic Disease.
H. M. Little

11.30 a.m. Rheumatoid Arthritis.
A. Mackenzie Forbes

Friday, June 15th.

Medicine

10.00 a.m. to 12.00 Ward Rounds
C. A. Peters
A. H. Gordon

10.30 a.m. to 12.00—Medical Outdoor clinic
C. F. Wylde

XUM

9.30 a.m. to 12.00—Metabolic Laboratory Methods.
I. M. Rabinowitch

Surgery

9.30 a.m. to 12.00—Operative Clinics.
Drs. Bazin, Eberts, Pennoyer, Henry and *Gurd.*

11.00 a.m. to 1.00 p.m. Surgical Outdoor Clinic.
W. L. Barlow

1.00 p.m. Operative Clinics.
Drs. Hutchison, Barlow, Tees and *Johnson*

Saturday, June 16th.

Medicine

10.00 a.m. to 12.00—Ward Rounds.
C. A. Peters
A. H. Gordon

10.30 a.m. to 12.00—Medical Outdoor Clinic.
J. Geo. Browne

11.00 a.m. to 12.00—Dermatology—Outdoor Clinic.
G. G. Campbell

Surgery

11.00 a.m. to 1.00 p.m. Surgical Outdoor Clinic.
C. K. P. Henry

10.00 a.m. to 12.00—Fractures—Follow up Clinic.
F. J. Tees
F. B. Gurd

HOTEL DIEU

Wednesday, June 13th.

9.00 a.m. to 12.00—Clinical Symposium on the Endocrine Glands.

Thursday, June 14th.

9.00 a.m. to 12.00—Clinical Demonstrations in the wards and Theatres.
(According to cases available)
Details will be announced in the Daily Bulletins.

ALEXANDRA HOSPITAL

(Contagious Diseases)

Ward Rounds and Demonstrations daily throughout the week—except Tuesday.

MENTAL DISEASES

Arrangements have been made with St. Jean de Dieu Hospital (Longue Pointe) and the Protestant Hospital for the Insane (Verdun) for a series of Demonstrations and clinics. Details will be announced in the Final Programme.

TUBERCULOSIS

The Bruchesi Institute and the Royal Edward Institute will demonstrate the diagnosis and management of Tuberculosis in an Outdoor Clinic.

Relative Value of Surgery and Roentgen Ray in the Treatment of Hyperthyroidism.—Edward P. Richardson, Boston, states that a comparison of the cases treated by roentgen ray and those treated by thyroidectomy shows that the average results in all cases treated by subtotal thyroidectomy are better than the results in a selected two-thirds of the cases treated by roentgen ray. The metabolism shows a drop to about +10, as compared with +20 for the roentgen ray cases; the pulse, a drop to 80, as compared with 90; the weight, a tendency to more persistent and greater increase. The rate of fall in metabolism and pulse is about equal. The reason for this is that in certain of the patients who underwent ligation of both superior thyroid arteries, followed by thyroidectomy in two stages, the whole of the surgical treatment required four months, and in one case eight months for completion. In nine cases treated by immediate subtotal thyroidectomy in one stage the sharp fall in metabolism and pulse and gain in weight are striking. Richardson says there can be no doubt that the average results in surgery are better than those following roentgen ray treatment. The roentgen ray has a beneficial effect in certain cases of hyperthyroidism, but this effect is not sufficiently constant to be relied on as the sole form of treatment. In selected cases of exophthalmic goitre, the use of roentgen ray treatment under careful control is justifiable for a period of four months, during which the patient receives about five treatments. If, after four months of treatment, the degree of improvement obtained in general condition and basal metabolic rate does not promise "cure," operation should be undertaken.—*Jour. Am. Med. Assoc.*, March 24, 1923.

Clinical Experience With Kolmer Complement Fixation Test for Syphilis.—The Kolmer complement fixation test Jay Frank Schamberg and S. S. Greenbaum, Philadelphia, state is distinctly more sensitive than the routine three antigen method. With its employment, the serums of syphilitic sub ects are slower in becoming negative, thus insuring more adequate treatment. The test detects relapsing positives at an earlier period than the older method. The quantitative character of the test enables the physician to determine more accurately the serologic status of the patient, and to gauge the influence of treatment. The authors have never observed a false positive reaction by the Kolmer test. They regard the Kolmer test as an invaluable advance in the serologic study of syphilis.—*Jour. Am. Med. Assoc.*, March 24, 1923.

SURGICAL POSSIBILITIES IN TRAUMATIC RUPTURE OF THE INTESTINE*

A. L. Lockwood, M.D., C.M., F.A.C.S.

Lockwood Clinic, Toronto

IN considering the surgical possibilities of intestinal injury, the effect of involvement of other hollow and solid viscera within the abdomen must be clearly borne in mind. Although up till 1915 some doubt apparently existed as to the necessity for operation in intestinal injury and opinions differed as to the nature of the operation when undertaken, the last three and one-half years of war surely determined beyond doubt the routine procedure necessary to save life in undoubted perforations and lacerations of the intestine. There are, however, certain intra-abdominal emergencies caused by external violence without penetration of the abdomen, the diagnosis of which is always difficult and often impossible. The scope of this subject is so vast that I will confine myself to a *resumé* of the surgical possibilities of these cases, having clearly in mind the fact that other grave injuries are frequently associated with the involvement of the intestine. What the surgeon must determine is whether he is dealing with a trivial injury for the relief of which an operation is entirely unnecessary, or whether he is confronted with a grave calamity demanding immediate surgical interference.

Etiology.—Rupture of the intestine is caused: (1) By direct crushing compression; (2) by tearing, due to sudden oscillation; (3) by bursting of the intestine.

The injury may be due to: (1) A sharp blow on the abdomen by a large object, as a horse's hoof; (2) a sharp blow on the abdomen from a small object, travelling at a high speed; (3) direct compression by being crushed or running against a sharp object; (4) an indirect force such as falling on the feet or buttocks, or a blow on the back or loin; (5) increased air pressure within the intestine, the so-called pneumatic ruptures, of which twenty-six cases have been reported, caused by compressed air being forced suddenly into the rectum.

Direct compression of the intestine against the vertebral column, the promontory of the sacrum or the crest of the pelvis is the commonest cause. A small percentage of ruptures are due to sudden oscillation. Rupture due to this cause results in a tear usually at the fixed portion of the gut, generally at the duo-jejunal flexure, occasionally at the ileo-caecal junction. Rupture occurs more easily in a relaxed abdomen with distended intestine and is facilitated by adhesions, disease of the intestinal wall and hernia.

The extent and site of the lesions.—Rupture may be complete or incomplete, and the symptoms thus be immediate or delayed. Most ruptures involve all the coats of the intestine but partial rupture is not uncommon. Whether it is the mucous or submucous coat or the peritoneal coat that is most often involved in partial rupture is a question, I believe, of the nature of the force applied. Certainly melæna is rarely observed in such cases, which would lead one to doubt if the mucous and submucous coats are often torn without involvement of the peritoneal coat. Usually it would seem that it is the peritoneal coat that first gives way and later the submucous and mucous coats. Hertle fairly well confirmed this experimentally. Gangrene and late spontaneous rupture of gut cut off from its blood supply by thrombosis of the mesenteric vessels is not uncommon. Complete severance of the small intestine is usual. Laceration due to tearing occurs at the fixed portion of the small intestine. Partial rupture of the circumference of the large bowel is most commonly found. Lesions of the duodenum and colon are very often retro-peritoneal.

I have collected six hundred and fifty-two cases of traumatic rupture of the intestine occurring in civil life, reported by various authors. Many such cases were reported during the war but are not included. Of the six hundred and fifty-two cases, approximately one in ten involved the large bowel and the rest the small bowel. Allowance must necessarily be made for some unavoidable

*Read at combined meeting of Sections of Medicine and Surgery, Academy of Medicine, Toronto, Nov. 21st 1922.

over-lapping in reported statistics. Of injury to the large bowel, the caecum, transverse colon, and pelvic colon are involved in that order. The jejunum and ileum appear to be injured in equal proportions, and about three times as often as the duodenum. It would seem logical, however, that the ileum should be the most common site of rupture and such would probably be borne out if the exact site of rupture had been stated in all cases.

With external bruising above the umbilicus, the first few feet of the jejunum are usually involved, whereas, when the bruising is below the umbilicus the ileum, as a rule, is involved.

rectum, and whether or not morphine has been administered. Symptoms may appear immediately after the accident or be delayed even though there be complete rupture of the intestine. Usually delayed symptoms are associated with partial rupture but cases have been reported of complete rupture of the empty jejunum, in which no symptoms appeared for at least fifteen hours. Moynihan, LeConte, and others have pointed out the difficulty of recognizing early a rupture of the first part of the jejunum in a patient who has not eaten for many hours. LeConte describes a typical case of a man injured at 8.30 a.m. who had not partaken of food since the evening before.

TABLE I

SITE OF RUPTURE

	Curtis 1887	Makins 1899	Chavasse	Gage 1902	DaCosta 1903	Hertle 1907	Berry and Guiseppi 1908	Zeidler's Clinic 1912	Cope and Johnson 1914	Moynihan 1915	Battle, 1919 (collected to 1919)	Andrews, Bendixen and Blything	Buckbinder (pneumatic rupture)	Various authors	
Large Intestine	7	5	19	11	..	11	10	3	2	..	11	26	..	..	10.3%
Caecum	..	1	..	..	..	2	2	..	..	..	..	..	..	..	..
Ascending Colon	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..
Hepatic Flexure	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Transverse Colon	..	2	..	..	..	2	3	..	..	..	..	..	..	..	..
Splenic Flexure	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Descending Colon	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Sigmoid Flexure	..	1	..	..	..	3	4	..	..	..	..	..	..	..	..
Rectum	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..
"Small Intestine" (not otherwise stated)	103	16	..	2	2	31	25	..	43	2	2	..	..	5	89.7%
Duodenum	6	7	..	10	..	12	28	1	5	..	32	..	..	..	..
Duodeno-Jejunal Flexure	..	..	..	..	..	..	3	..	..	1	..	..	..	..	..
Jejunum	..	..	106	20	1	29	32	48	23	..	111	..	..	3	..
Ileum	..	..	..	42	1	40	32		13	..	59	..	..	4	..
Large and Small Intestine	..	..	7	..	..	..	4	..	..	..	..	..	..	..	..
Not Stated	..	..	..	..	31	..	..	..	..	14	..	..	..	..	..

Symptoms of intestinal rupture.—The symptomatology of intestinal rupture varies with the nature of the injury, the association of other injuries, the location and extent of the lesions of the intestine, the general resistance of the patient, the state of the intestine when injured, whether full or empty, the interval and activity of the patient following the injury, and the treatment from the time of the accident till examined, whether or not fluids have been given by mouth or

Fifteen hours later he showed no signs of intestinal injury. During the next six hours the symptoms of ruptured intestine rapidly developed, the temperature became subnormal, the pulse steadily increased, respirations became rapid and thoracic in type, vomiting began, tenderness in the region of the umbilicus was complained of, tympany and distension developed, and the face became drawn and anxious. Operation revealed a complete rupture of the first part of the jejunum ex-

tending two and one half inches into the mesentery; in addition there was further injury to the mesentery and beginning gangrene of one foot of the intestine. It is in such cases that the early symptoms are so slight that the surgeon develops a false sense of security, and the patient is neglected till peritonitis excites more alarming symptoms, too late to be saved by surgery in the majority of such cases. Holland[18], Poland[19], Battle[16], Berry[7] and Guisseppi have reported cases with incomplete rupture which went on for days, weeks and even months before complete rupture developed followed by grave sequelae. In the great majority of cases symptoms immediately follow the rupture.

Primary shock develops in most patients almost at once after the rupture occurs. It usually is not intense if due to rupture solely. It may not occur at all, it may develop later, it may clear up quickly or pass on to secondary shock. Complete rupture or extensive laceration may not produce any primary shock whatever and on the other hand a single small perforation may induce grave shock. Apart from being associated with haemorrhage, the speed with which reaction from shock follows is no indication of the extent of the lesion. At least six out of fifty-nine cases reported by Berry and Guisseppi[7] showed no shock whatever, but continued their work, walked home or to the hospital. I have known several patients to have walked and dodged about from one shell hole to another even for two or three hours before lying down. Curtis[1] mentions two patients who showed no signs for twenty and twenty-six hours respectively. Shock was present, however, in eighty per cent. of his cases.

The temperature is usually subnormal at first, the *pulse* weak and thready, and the *respirations* are thoracic. The temperature rises with the reaction from shock and if it falls again and the pulse steadily increases in rapidity, serious trouble is present. The respirations become more rapid, shallow, and purely thoracic. Battle[16] and other authors state that a temperature even as high as 103° is an absolute indication of rupture of the intestine. Perhaps that is true, but in the cases I have seen it has been observed only in patients who came under our care too late for surgery and who already had localized or spreading peritonitis, but were offering a fair resistance to the infection. I cannot credit it as an early indication. A steadily increasing pulse-rate, if not due to haemorrhage, regardless of the temperature, is a grave sign.

Abdominal Facies.—The anxious, pale, drawn face, the alertness and apprehensiveness of the patient with ruptured intestine is almost characteristic. LeConte deplores the fact that he cannot paint it. He considers it almost diagnostic. No one of us who have seen many of these cases can ever forget that face. To my mind it is almost pathognomonic. It may come on early or late but it will be there sometime. In the late cases there is a peculiar listless expression, an absolute sign of extreme toxaemia from peritonitis.

Vomiting is a very important symptom and is invariably present. It rarely appears at the first except in a lesion of the duodenum or first part of the jejunum. It usually develops within an hour or two of the injury depending on the degree of primary shock and the reaction to it. The vomitus is rarely blood stained except when the duodenum is involved. It is stercoraceous and projectile later on. Nausea is usually present from the outset.

Pain and tenderness may be due to the superficial bruising only, but there is a deep, well localized type of pain, and particularly of tenderness, that is present in practically all cases. The type of deep pain and tenderness associated with intestinal rupture tends to radiate to the loins or deep in the pelvis, depending on the site and extent of the lesion and the reaction of the surrounding tissues to the infection.

Abdominal rigidity, either localized over the area of injury or general, is typical of the condition. It is present in all cases except a small percentage of patients in whom the "flaceid abdomen" is found. The latter is usually an indication of extensive multiple lesions of the small bowel, low down, in a patient with little general resistance. Early in my experience of such cases I recognized the almost inevitably fatal result, regardless of treatment. Progressive, board-like rigidity is usual and always indicates serious trouble. It was absent in four out of fifty-nine patients reported by Berry and Guisseppi[7]. Dulness locally over the area involved is common but it usually is a late evidence of nature's attempt to mat up the area about the rupture.

Abdominal distension and tympany may be due to paresis from the trauma apart from perforation. Increasing distension may be due to bleeding, escape of fluid content of the bowel, or to accumulating serous fluid poured out by the inflamed peritoneum. Increasing distension 8-10 hours after the appearance of the first symptoms is a grave sign. Very few patients recovered

on whom I operated after distension had occurred when due to the last two causes.

Cutaneous hyperaesthesia over the site of injury is present in most cases but I cannot attach the importance to it as a diagnostic feature that Stanley[20] and others do.

Absent Liver Dulness.—LeConte, Berry, Moynihan and others agree as to the worthlessness of this sign in early diagnosis of ruptured intestine. Surely it is late evidence of serious trouble. It should be found in late cases only, or those that are inoperable for other reasons. Berry[7] states that in none of his seventeen successful cases had the liver dulness disappeared. On the other hand those patients on whom he operated after the liver dulness had disappeared all died. I did not have a single recovery of patients operated upon after the liver dulness had disappeared.

Dulness in Flank.—If present early, it is usually due to haemorrhage or escaping intestinal contents. If seen late, it is, as a rule, due to outpouring of serous fluid from the peritoneum, and is a serious symptom.

Surgical emphysema develops in a certain percentage of patients with rupture of the duodenum or colon retro-peritoneally. It is important to recognize it. In the presence of emphysema, on opening the abdomen the duodenum and colon should be explored thoroughly regardless of the other injuries found.

Blood may appear in the stool after partial rupture but rarely appears in complete rupture. It is of no value in the early diagnosis of ruptured intestine. The majority of reported cases have been in young, adult males.

Diagnosis of Intestinal Rupture.—The extreme urgency of an early diagnosis of spontaneous rupture of the intestine cannot be exaggerated. Delay of one hour at the critical period may take away the chance of recovery after operation. There is no one pathognomonic symptom of rupture. The subjective and objective evidence must be carefully weighed. The types of accidents producing such injuries must be appreciated. Persistent vomiting as the shock disappears, a steadily increasing pulse rate, localized or general abdominal rigidity, localized tenderness and deep pain, and later on the abdominal facies characterize most patients with intestinal rupture. Exact diagnosis may not be possible always, but a careful study of each patient will establish at least the need for operation. The question must not be, has the patient a ruptured intestine, but is there an intra-abdominal injury sufficient to demand an immediate exploratory operation? Delayed symptoms from an incomplete rupture must be looked for. The symptoms of septic

TABLE II

SEX—TRAUMATIC RUPTURE OF INTESTINE

	Makins, St. Thomas Hosp. 1889-1898	Berry and Guisseppi, 1893-1907 (10 London Hosp.)	21, Petry Prague Clinic and Literature	Hertle Cras Clinic and Literature	Cope and Johnson	Battle 1919	
Male	21	122	217	124	38	200	94.03%
Female	..	10	15	4	5	21	5.97%

TABLE III

RELATIVE AGES—TRAUMATIC RUPTURE OF INTESTINES

Age	Gage	Hertle	Berry and Guisseppi	Cope and Johnson	
1-10 yrs.	..	5	14	9	7.5%
10-20 yrs.	8	14	32	10	17%
20-30 yrs.	25	33	28	8	25%
30-40 yrs.	6	35	18	7	19%
40-50 yrs.	9	27	13	4	14.2%
50-60 yrs.	4	17	14	1	9.7%
60-70 yrs.	..	3	6	2	3%
Not Stated	..	7	7	..	3.8%

absorption without evidence of peritonitis in a questionable case usually points to retroperitoneal rupture of the duodenum and occasionally of the colon with a spreading infection retroperitoneally. Having ruled out an abdominothoracic injury, renal trauma and spinal injury, give the patient the benefit of the doubt and operate on all patients who, having had a blow in the abdomen from a flying object, a kick by a horse, a crush or fall, etc., complain of severe pain in the abdomen, persisting more than four to six hours after the injury, accompanied by local tenderness, nausea and vomiting, a rising pulse-rate, and increasing local or general rigidity, not waiting for the other symptoms to appear. The associations of the classical symptoms of intestinal rupture vary with each case. Experience in large numbers of abdominal injuries develops diagnostic intuition in the keen observer that cannot be gained in any other way. He may not be able even to say why he knows, but he just knows that such and such a condition exists. I was much chagrined in the spring of 1915, after hurriedly opening an abdomen for ruptured intestine, to find no intra-abdominal lesion, but later to find a partial fracture of the spine with pressure on the posterior roots. Later, in the fall of 1918, I was strongly urged by an eminent neurological surgeon to operate for intestinal rupture on another patient, whom my associates and myself felt certain had no rupture but had a partial fracture of the spine which proved to be the case. Such operations were not rare during the war.

Prognosis and Mortality.—It surely must be accepted as a fact that practically all cases of complete rupture of the intestine are fatal unless operated upon. Spontaneous cures have been reported. Investigation of such reported cases proves that the evidence of there having been a complete rupture is not as a rule convincing. Rupture of the duodenum and first part of the jejunum are attended with a high mortality because very often they are not recognized sufficiently early. At operation rupture of the retroperitoneal portion of the duodenum and colon are often overlooked. Rupture of the jejunum is not so serious as rupture low down in the ileum, provided operation is early, because the intestinal content higher up is not so infective as lower down. There is more tendency to multiple perforations in the ileum and pelvic colon because of the bony apposition of the pelvis as well as the spine. Rupture of the large bowel, while it does not produce the same degree of shock, increases the possibilities of an infective peritonitis, does not respond to surgery as well, and is attended with a higher mortality than that following rupture of the small bowel. The most important factor in estimating the prognosis, apart from the site and multiplicity of the rupture, is the time that has elapsed since symptoms appeared before coming to operation. Provided the primary shock has been successfully overcome the earlier the operation can be undertaken the higher the percentage of recoveries. Cases, if possible, should be operated upon not later than six hours after the appearance of symptoms, and before peristalsis has recurred. Between six and twelve hours the mortality increases at least fifteen per cent, between twelve and sixteen hours it increases another ten to fifteen per cent., and after sixteen hours the percentage of recoveries is small. After twenty hours it is questionable if anything but a palliative operation such as Murphy's supra-pubic drainage operation should be undertaken, except in very rare cases.

Bouilly[22], in 1883, performed the first laparatomy for rupture of the intestine. In 1888, Croft[23] had the first successful operation Senn[24] collected 376 cases operated upon with a mortality of 51.6%. A survey of his analysis shows a very high percentage of recoveries especially of late cases and, as it represents collected cases, it probably contains a higher percentage of published successes than of failures, and must accordingly, be discounted somewhat.

SENN'S CASES

Operated upon—	Mortality
Cases within the 1st 4 hrs.	15.2%
" 5-8 hrs.	44.4%
" 9-12 hrs.	63.6%
" later than 12 hrs.	77%

Curtis, in 1887, reported 116 collected cases all fatal without operation. Homer Gage, in 1902, collected eighty-seven cases reported after 1887, forty-five cases, not operated upon, all died, forty-two were operated upon with seventeen recoveries, forty-two and one-half per cent. Of twenty-nine cases operated upon within twenty-four hours of the accident, thirteen recovered, and of four operated upon within the next forty-eight hours, two recovered. Five died within one hour of operation indicating that they were operated upon still suffering from shock or that the operation itself largely contributed to the death. LeConte, in 1903, reported a mortality rate, averaging between fifty to sixty per cent., in thirty-five cases, upon which he operated. Makins

reported twenty-one cases operated upon at St. Thomas' Hospital between 1898 and 1906 with three recoveries. Berry and Guisseppi, in 1908, reported 132 cases of their own. One hundred and fifteen died, eighty-four were operated upon, seventeen recovered. Of the forty-seven not operated upon, all died. Eisendrath[25], Pelting[26], Kirstein[27], Cope and others published equally discouraging results. In 1914, Lincoln Davis[28] reported two recoveries after operation, approximately nineteen hours and two hours respectively after appearance of symptoms. During the war many cases were operated upon, with an approximate operable mortality of sixty per cent. In 1919, Battle reported a total of two hundred and twenty-one cases collected in Great Britain, including all cases of Croft's in 1888, those of Berry and Guisseppi, a list by Raymond Johnson[29] published in 1914, Makins' series, and later reports from St. Thomas' Hospital Records and other sources. One hundred and twenty-four were operated upon with forty-eight recoveries and seventy-six deaths. Gordon Taylor[30] and Berry[31] made some interesting contributions to the subject in 1921. Berry published a table showing the result of operation in collected cases.

	10 London Hosp. 1893-1907	12 London Hosp. 1908-1912	Zeidler Clinic, Petrograd 1897-1910
Cases admitted.....	132	44	52
Cases operated.....	84	30	49*
Recoveries after oper..	17	9	8
Percentage of recoveries	20.2%	30%	16.3%

Complications.—Approximately one out of every five cases of rupture of the intestine is complicated by the co-existence of other severe injuries. The complications are: Rupture of the spleen, rupture of the liver, rupture of a kidney, rupture of the pancreas, rupture of the stomach or bladder, rupture of the diaphragm and lung, mesenteric thrombosis, fracture of the pelvis, fracture of the costal margin of the ribs, and fracture of other bones.

Treatment

Operation at the earliest possible moment depending on the general condition of the patient is the only means of saving life. Peristalsis is inhibited in most cases of injury of small intestine for the first six hours and every effort should be made to delay peristalsis and to operate before it reappears. Patients should not be operated upon while shock is evident. Shock in such cases can be hurriedly combatted by heat, morphine, saline into the breasts and transfusion if necessary. Nothing should be given by mouth or rectum. Transfusion is indicated in all cases of extreme shock regardless of whether or not the patient has bled. It should not be employed in such cases, however, till other methods have been tried. Morphine should not be administered except in small doses till the decision is made whether to operate or not. The surgeon must not be deceived by the apparent improvement after administering morphine. Morphine is a gift from the gods and in its wonderful, soothing, sedative effect lies the reason for the so-called "expectant treatment," "armed expectation," etc., extremely dangerous methods masquerading under seductive terms. Having decided to operate, morphine should be administered to overcome the pain, restlessness and apprehension of such cases, and to retard the peristalsis already inhibited by the injury. Combination gas and oxygen anaesthesia with local infiltration of the abdominal wall with one-half per cent. novocaine should be employed. The abdomen should be widely opened by a paramesial incision over the area of contusion of the abdominal wall if possible. If no superficial bruising is present the incision should be planned to allow access to the area of deep tenderness. A definite routine should be developed in exploring the abdomen. Explore first the site of suspected rupture and if a rupture is found, cover it with gauze to protect the abdomen from soiling by further escape of intestinal content. Then start at the ileocecal junction and run the small bowel hurriedly but gently through the fingers, carefully viewing it as it passes through. If it is difficult to examine the bowel in this way, it is safer to gently eviscerate the small bowel, protect it with gauze wrung out of hot saline and then quickly explore it. Beginning at the caecum hurriedly explore the colon, palpate the spleen, kidneys, liver, stomach, bladder, and rectum. Bear in mind that multiple ruptures are present in twenty per cent. of cases. There is no surgeon who has had large experience in perforations of the intestine, who has not overlooked a perforation, to find it later at autopsy. Of eighty-four cases reported by Berry and Guisseppi, in fifteen

*Of these forty-nine, ten were operated upon within six hours and five recovered. Of twenty-seven cases seen personally during the year 1914 to the fall of 1918, fourteen came under our care too late for surgery, or were complicated with other equally serious wounds, and died. Thirteen were operated upon with five recoveries. Rupture of the bladder complicated two of the eight fatal cases operated upon, and severe retro-peritoneal injury with involvement of a kidney was present in two others.

no rupture at all could be found. Autopsy proved that seven of the fifteen had a rupture of the duodenum. In all doubtful cases carefully investigate the duodenum, jejunum, and colon. Resection of the large or small bowel should be avoided and is rarely necessary. Darn the perforation, laceration, or rupture even though complete. Unless the mesentery is destroyed over a considerable length, the viability of the bowel need not be worried about. If the glossy lustre of the intestine is present and it bleeds on being pricked with a needle, resection to avoid gangrene is unnecessary even in the presence of intense discolouration. Although I appreciate that many cases of gangrene at the site of suture have been reported, I personally have not had such a case since I quit resection for perforation. I resected many cases up till the middle of 1916. From that time to the fall of 1918, eleven hundred patients were operated upon in my hospital for injury to the intestine with only thirteen resections. Hurried darning with No. 0 catgut is sufficient for the smaller lesions and for a complete lesion a second re-enforcing layer of Lembert sutures of catgut is sufficient in the small bowel. For the large bowel I prefer at least two layers of sutures and reinforcing with linen or silk. The value of omental tags, not detached but sutured over the area of repair, cannot be over-estimated, especially in colon work. If resection is necessary, employ end-to-end anastomosis in small and large intestine alike. I have not yet appreciated the necessity for prolonging the operation to do lateral anastomosis. In extensive ruptures and contusion of the large bowel and of the duodenum palliative operations may be the limit of safety. The colon may be hurriedly mobilized and the severed ends delivered as for colostomy. If the duodenum is ruptured retro-peritoneally or the jejunum is torn across at its junction with the duodenum, it may be necessary to close off the proximal portion entirely and implant the jejunum into the stomach. Jejunostomy or ileostomy rarely save life in these cases. The recoveries from rupture of the duodenum are extremely rare. Berry could only find one successful case in the literature up till 1908. If they survive the operation, a duodenal fistula very often develops, followed by emaciation and death. Many successful cases were, however, reported during the war.

After repairing the rupture, the abdomen should be thoroughly mopped out with gauze wrung out of saline. *Abdominal irrigation or lavage was disastrous in our cases.* Careful records of the blood pressure showed that it was immediately raised but later fell ten to twenty, and even thirty degrees, below what we found in those patients who did not have irrigation. It also encouraged serous effusion into the peritoneal cavity and necessitated drainage. On the advice of a well known surgeon, we tried it on a small group of cases of perforation of the intestine, but abandoned it at once. Drainage is unnecessary except in patients operated upon late after peritonitis is well established and serous fluid is already being poured out into the peritoneal cavity. A suprapubic drain is then all that is needed. The abdominal wall should be closed in layers reinforced with through and through silk worms, if time permits it. Otherwise the abdomen should be hurriedly closed with through and through silk worm sutures. In patients with a fatty abdominal wall, it is a wise precaution to leave a wick of rubber tissue down just to the peritoneum at each end of the incision for the first forty-eight hours. During operation, and immediately after, it is advisable to keep up hypodermoclysis into both breasts and after operation a Murphy drip of five per cent. sodium bicarbonate and glucose should be carried on per rectum for the first forty-eight hours. Sips of tepid water or barley water may be given per mouth, but no purgatives should be administered. In a previous contribution[34], I pointed out the value of re-establishing the tone in the bowel above the site of rupture before closing the abdomen, by gently massaging the intestine from well above the collapsed area to well below it. Troublesome ileus did not develop after we instituted the method. It is apparently a question of re-establishing active circulation. Pituitrin or eserine may be employed if necessary to overcome distension. Morphine in small doses may be freely used to combat restlessness without any regard to the dread of intestinal distension.

What are we to do with the late cases, already markedly distended, tympanitic, vomiting continuously, and with general or localized peritonitis? All active surgical measures to combat peritonitis etc., are valueless, in fact, destroy the little chance the patient has. Enterostomy to overcome distension from obstruction rarely saves the patient. The administration of morphine in large doses till the respirations are reduced to twelve to fourteen to the minute, heat to the abdomen, saline per rectum, and in the breasts, are all that can be done. I believe I have seen at least a few

cases of undoubted perforation by penetration recover without operation, and an occasional recovery after spontaneous rupture has been reported. In these cases a localized abscess forms that later requires drainage only. Mr. Gordon Bell[35], during the war, had an undoubted case of spontaneous healing of perforations of the small intestine from a gunshot wound. The man was later wounded and died, and the intestine recovered at autopsy.

Conclusions

1.—The extent of the injury to the abdominal wall is no indication of the amount of damage to the viscera.

2.—It is practically an undisputed fact that complete rupture of the intestine, not operated upon, is invariably fatal.

3.—The small bowel is involved much more frequently than the large, in the proportion of nine to one. The rent is usually transverse and multiple rents occur in one out of every five cases.

4.—Bearing in mind that after rupture of the small bowel the mucous membrane generally everts through the rupture and tends to prevent leakage and that peristalsis is inhibited for approximately six hours, operation not delayed beyond six hours gives by far the best chance of recovery.

5.—The death rate has been over seventy per cent. Only by early diagnosis and operation as soon as the patient can stand the surgical interference, can the mortality be reduced. The mortality should not be more than forty to fifty per cent. in civil accidents.

6.—The early symptoms of complete rupture of the intestine are few, but very characteristic.

7.—If the abdomen is distended and the liver dulness absent operation is of little value.

8.—Last resort surgery in such cases is of no value, in fact takes away the only chance the patient has. Advocate invariable intervention even in doubtful cases, though it may be purely exploratory.

9.—In all cases whether the diagnosis is doubtful or not, bear well in mind that the important question to decide is not—"Is there a rupture of the intestine?" but "Is there an intra-abdominal lesion sufficiently serious to require operation as soon as the patient's condition will permit of it?"

10.—The profession generally should thoroughly appreciate that if a man is kicked in the abdomen or otherwise injured there, even though he may not appear acutely ill at the outset, and if he complains of persistent pain, he should be sent to the hospital or at least kept under hourly observation until all danger of a ruptured intestine is passed.

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RUPTURE OF THE BLADDER

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RUPTURE of the bladder by violence is a rather rare accident and this is especally so in children, yet within the last few months I have seen two cases. The first was in the practice of Dr. Sneath of Dromore. On the evening of April 29, 1922, he saw a little girl four years old who had fallen off a waggon loaded with stones, and it was supposed that either she had struck the hub when falling or that the wheel had passed over her. The accident happened at 3.30 p.m. and Dr. Sneath saw her at 4.15 p.m. She was crying and complaining of abdominal pain and tenderness but there was no marked rigidity. She had vomited a couple of times, was pained, had a rapid pulse, and slightly subnormal temperature. Dr. Sneath diagnosed severe inter-abdominal injury and advised operation. At eight o'clock I saw the patient and found very little change had taken place in her condition, abdominal pain was not acute nor was there much tenderness, there was dullness posterially. I concurred with Dr. Sneath in advising a coeliotomy which was immediately done. The abdominal cavity was found to contain a considerable quantity of urine which had escaped from the bladder through a tear of a little more than an inch long in the fundus. The abdominal cavity was thoroughly cleaned by irrigation with warm normal saline solution rapidly introduced in large quantities through a rubber tube of wide calibre. The tear in the bladder was stitched with plain catgut, care being taken not to include the mucous membrane, and over this a Lembert suture was put in. There cannot be too much care used in doing the stitching for the place must be made water tight. Absorbable material should be used, for if by any means a stitch should penetrate and be exposed in the bladder, it will, if not rapidly disintegrated, be thrown off into the bladder and possibly become the nucleus of a stone. The bladder opening being closed, a final thorough irrigation was done, leaving no part of the cavity contaminated. The abdominal wound was closed in the usual manner and the catheter left in the bladder for eleven days when recovery was complete. This case recovered without a bad symptom, not even a rise of temperature.

The next case occurred in the practice of Dr. McLellan of Holstein. A boy of thirteen was struck by a plow handle in the lower abdomen and so little importance was attached to the accident and so comparatively light were the symptoms that he tried to continue working and it was not until twenty-four hours after the accident that Dr. McLellan saw him. He then had tenderness over the whole abdomen with dulness and distension in certain areas. A diagnosis of probable serious internal injury was immediately made and prompt operation advised. He was brought to the hospital at once and the abdomen opened thirty-one hours after the accident occurred. The cavity was found full of urine and the peritoneum intensely congested. A rent was found in the fundus of the bladder, running transversely and about an inch and a quarter long. The abdominal cavity was thoroughly cleaned out by irrigation which was rendered more difficult on account of many recent adhesions. The opening in the bladder having been closed as in the previous case, the peritoneal cavity was again washed out with meticulous care. The abdominal wound was stitched and a catheter fastened in the bladder; he was put to bed and progressed favourably until the tenth day when symptoms of obstruction appeared. The abdominal wound was re-opened and it was found that some of the adhesions had re-united. These were separated and the abdomen closed. The tear in the bladder was perfectly healed. From this time on recovery was uninterrupted. The prompt recognition by the physicians first called of the seriousness of the cases and of the urgent need of operation were the factors which made success possible. In abdominal injuries many lives are lost through delay in waiting for positive

signs of definite damage to some viscus. When with the lapse of time the case becomes clinically clear, it is usually surgically hopeless. The only safe rule is when in doubt open the abdomen, fór any other course is that of ignorance in trusting to luck. So slight are the symptoms in some cases of rupture of a viscus that the injured person is able for hours to go on with his work and therefore no time should be lost because the symptoms do not seem urgent. I cannot too strongly urge the thorough cleansing of the abdominal cavity when it is filled with foreign matter for upon this as much as upon anything else depends the issue. Failure to properly clean the peritoneum has been the cause of many deaths and it is the less defensible since it is so easily done and because the patient's condition will improve during the doing. To clean the peritoneum with sponges or mops when the whole cavity is filled with urine or pus is impossible and the surgeon who trusts to that method will have an unnecessarily high death rate.

EMPYEMA AND ABSCESS OF LUNG*

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IN the limited time at one's disposal it is quite impossible to cover in any detail the surgical treatment of empyema and abscess of the lung. Empyema has been so forcibly brought to our attention during the late epidemics of influenza that anything I might say on this subject could not possibly add to what has already been written. I shall therefore discuss empyema very briefly and in a general way, and go perhaps a little more into detail in dealing with lung abscess.

The principles underlying the proper treatment of both these maladies is simply an application to specialized diseases of well established surgical principles. In a word one must provide adequate drainage for an empyema or a lung abscess, whilst at the same time protecting the neighbouring tissues and organs from damage. The latter is fully as important as the former and is very frequently forgotten in our zeal to treat the disease.

Just what method we choose to adopt is of no consequence so long as we accomplish our end

Empyema.—The first essential for treatment, be it medical or surgical, is to know the infecting organism. For this reason an exploratory puncture and, if possible, a bacteriological examination is very much to be desired. Should this reveal the fact that the empyema is due to the pneumococcus, the treatment is simple; *adequate drainage* whether by (a) aspiration; or (b) by thoracotomy and closed method of drainage; or (c) thoracotomy with rib resection. It would appear that pneumococcal empyemas do best with rib resection without preliminary aspiration or closed type drainage, but any of these methods willl be effectual in pneumococcal cases if the drainage is adequate.

Should bacteriological examination show the infecting organism to be a streptococcus, then the condition is much more grave and the treatment correspondingly more complicated.

Streptococcal empyema may be discussed under three headings, *viz.*, early, late and chronic. By "early" we shall mean those cases which become evident before the pneumonia has subsided. Under "late" empyemas we include those treated after the original lung condition has completely cleared; while three months after the pneumonic symptoms have subsided may be taken as an arbitrary date for the beginning of the "chronic" form. The early cases should all be treated medically, that is, by aspiration. This should be repeated every day or every second or third day as circumstances require, until a cure is effected or until it is evident that aspiration will not cure. A certain percentage of cases are cured by simple aspiration and the earlier this is begun the better the chance of cure. The majority of cases however require more efficient drainage than aspiration. For these other cases, especially if it is still early in the disease, it is probable that thoracotomy and closed drainage does best. This is a very simple

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procedure which can be done in any country home without removing the patient from bed. All that is required is—a trocar, a cannula and a catheter, which will just snugly fit the latter. Under local anaesthesia, preferably one-half per cent novocain, one raises an intradermal wheal one-half inch in diameter, and then injects about a drachm of solution so as to infiltrate the intercostal tissues and pleura. After waiting ten minutes for the anaesthesia to take effect, one inserts the trocar and cannula and then withdraws the trocar immediately replacing it by the catheter to which has been attached a long rubber tube, the distal end of which is under water. It is always wise to cut a second opening in the catheter opposite to and one-half inch above the eye. The catheter is carefully strapped to the chest in order to render the opening air-tight. Opinions differ as to the best method of treating cases where closed drainage is used, but the majority of people seem to favour irrigation with hypochlorite solution (Dakin's). If this method is adopted it is always wise to use saline for the first irrigation, because should there be a communication through into a bronchus Dakin's solution might set up very severe coughing.

There are many complicated methods of irrigating an empyema; but time does not permit discussion of these. A fairly high proportion of cases recover under this closed method of drainage, but certain cases require even free drainage and for these must be reserved thoracotomy with resection of a piece of one or two ribs. This should be done only after all inflammation in the lung has subsided and after adhesions have had time enough to form and so prevent collapse of the lung. The technique of this operation is so well known that it requires no description. The only points I wish to urge in this connection are: (1) Do not do it too early; (2) do it under local anaesthesia; (3) allow the contents to escape slowly; (4) explore the cavity thoroughly to make sure that all pockets can drain freely, and remove all the mass of lymph which might impede drainage. I think that these cases do better if irrigated with Dakin's solution.

When we come to deal with chronic empyema, we are confronted with a very trying series of cases. I feel sure that early and adequate drainage would prevent a great number of cases of this disabling disease. In treating chronic empyema one should lean toward conservatism, and reserve all mutilating operations for those cases which will respond to no other treatment. The first essential in treating these cases is very free drainage and here one should resect sufficient rib to permit of thorough exploration of the cavity, so that all pockets may be opened and any bands which are obstructing drainage may be broken down.

Following this I think the ideal care can be given by means of the "Taylor tidal wave" which, as most of you know, provides very efficient irrigation combined with free drainage. I think the great advantage of this method is that the irrigating fluid reaches small sub-pleural lung abscesses and other badly-draining pockets which can be reached by no other method of irrigation. Under this treatment the thickened pleura tends to become more pliable and the lung correspondingly expanded.

Should this method after a fair trial not accomplish a cure, the next step should be some type of decortication operation. Of these the least damaging is the viscero-parietal decortication combined with deep scarification of the remaining visceral pleura, in such a way as to divide it into little squares with the incision going right through the pleura. This permits of a very satisfactory expansion. At the time decortication is done, all infected foci should be removed. This operation should be done only after efficient sterilization of the cavity by irrigating it as described. For the few cases which this type of treatment fails to relieve, one must resort to some type of extensive rib resection with collapse of the chest wall. Inter-lobar empyema should be treated in exactly the same way as lung abscess.

Abscess of the Lung.—My part in this symposium is limited to its surgical treatment; but the surgical treatment cannot be discussed entirely by itself for two very good reasons, (1) because surgical treatment is not required in some cases of abscess of the lung, and, (2) because it is unwise to undertake an operation of this kind until the patient has been put through a preliminary course of medical treatment. This preliminary treatment is of prime importance and I shall deal with it first. In the second and third parts of my paper, I shall discuss the technique of operation and post-operative care, including complications.

Preliminary Treatment.—The preliminary treatment which I am going to recommend is important for two reasons: First, it may render an operation unnecessary, and second, it is the best preparation for an operation, if an operation should prove to be necessary. For these reasons

all cases of lung abscess should be given at least three weeks of what we might call strictly medical treatment, consisting of: (1) rest in bed, in the fresh air if possible; (2) full diet. This is most important. The patient should be fed up to the limit with nutritious foods; (3) administration of alkalies with the idea of reducing the zone of penumonitis and tissue cytolysis which is always found about an abscess cavity; (4) postural treatment aimed at finding the position in which the abscess drains into the bronchus if there be such a communication. The patient should assume this posture at least four times daily, remaining fifteen to twenty minutes or longer, if necessary to completely empty the cavity.

Three or four weeks of this kind of treatment will sometimes effect a cure. However, if physical signs, confirmed by x-ray, show that the abscess is still persisting, it is advisable to resort to surgical drainage. In that case the preliminary treatment has rendered the operation safer: (a) by improving the general condition of the patient; (b) by reducing the zone of pneumonitis about the abscess through alkalinization; (c) by giving the surrounding tissues time to become more or less fixed, especially the mediastinum, thus rendering the abscess a more localized disease; (d) by showing accurately the location and outline of the abscess.

In operations for lung abscess the closest cooperation of the radiologist with the surgeon is essential. I depend much more upon the localization of an abscess as marked out by a competent radiologist than upon the physical signs elicited by ordinary means. I have the radiologist localize the abscess by fluoroscopy and have him give me three points as guides, *viz.*, anterior, posterior and lateral. One can in this way determine pretty accurately the part of the chest wall from which the easiest access to the abscess is to be had. The abscess should be opened where it comes nearest the surface. In this connection one might state that, generally speaking, abscesses of lower lobe are best approached from behind, those of middle part of lung from the axillary region, and those of the apex from the front. As a rule genuine pyogenic abscesses of the apex are easily got at on account of their nearness to the chest wall. Right here let me warn you to operate on no abscess of the apex without first eliminating the possibility of tuberculosis. All operations on abscesses of the lung should be done under local anaesthesia in two stages, unless it is evident that the visceral and parietal pleura are adherent.

Technique.—Under paravertebral blocking of four to six intercostal nerves or local infiltration anaesthesia of a good sized area, a curved incision is made, raising a flap at least four to six inches in diameter. This should include skin and muscles so as to expose ribs and intercostal muscles for four to six inches. Then resect at least four inches of two, or preferably three, ribs subperiosteally. This wide excision of rib is important as it mobilizes considerable chest wall and leaves the cut ends of the ribs far enough from the field, which will later become infected, thus partly eliminating danger of osteomyelitis of the rib.

Then one inserts a suture through the intercostal tissues and the parietal and visceral pleura, in such a way as to accurately approximate the visceral to the parietal pleura. This row of sutures should be placed very carefully so that the pleural cavity will be absolutely shut off from the filled of operation. This circular suture should take in an area of at least two and one-half inches in diameter in the case of small abscesses, and a greater area if the abscess is large. The type of suturing best adapted for this purpose is one known as the Roux stitch, whereby each bite of the needle takes in about three-quarters of an inch of tissue, including intercostal muscles and both layers of pleura. The next stitch goes back half the distance of the first and emerges the same distance in front. Never try to suture parietal and visceral pleura without taking in some tissue from the chest wall, as the parietal pleura is practically sure to tear if sutured alone. The flap is then dropped into place and dressings applied, thus completing the first stage.

One week later the second stage of the operation is done, again under local anaesthesia. The same flap is raised, all bleeding controlled, and the parts well retracted to give good exposure. Then the whole field is smeared thickly with ordinary vaseline, paying particular attention to the cut ends of the ribs. With a large bore exploring needle, locate the abscess and then with a soldering iron, or a cautery, at a low heat, preferably not even red, one follows along the needle into the abscess cavity. This should be done rather slowly and by cauterizing a much greater area at the surface than deeper. In this way one produces a funnel-shaped opening into the abscess cavity. As soon as the cavity has been opened, the patient will probably cough if there

is any communication with the bronchus. This may be rather troublesome for a few moments and is due I think to the fumes from the burning tissue irritating the respiratory mucosa. Having made sure that the superficial part of the opening is wide, at least two inches if the abscess is at all deeply placed, one again smears all bare surfaces with vaseline and places a spirally cut rubber drainage tube one-half inch in diameter into the abscess cavity and then lightly packs the remainder of the cavity with gauze. Replace the flap, and suture only enough tissue to hold it in place. I have cut a circular opening directly over the opening in the lung and brought the drainage tube and gauze out through it. In such a case one can suture the flap back into position.

Post-Operative.—The post-operative management of these cases calls for considerable care. The primary dressing should be thick enough to practically prevent any sucking in of air through the drain. I have recently been in the habit of covering the tube and surrounding tissue with a moderate dressing. Then I put on a sheet of rubber dam large enough to extend well beyond the dressing and then apply more dressings and fasten firmly. I encourage the patient to lie on the affected side at night and to continue the postural treatment at intervals during the day. The dressings are changed as required and if the packing is foul and the patient will permit it, I instill enough hypochlorite (Dakin's solution) to deodorize.

The packing is left in position until it becomes quite loose when I withdraw a little each day. I have not been in the habit of repacking the abscess cavity, but I do put a little gauze into the wound in the chest wall and pack it gently about the tube. This is best changed daily or every other day. If there is a tendency towards flapping of the mediastinum it is wise to place a square of rubber dam over the skin and drain. The drainage is not interfered with. This rubber dressing produces a very satisfactory seal which effectually prevents the sucking of air and purulent material into the bronchi. I feel that this method of dressing has saved at least one case whose chest was rapidly filling up—and whose condition had become alarming.

Complications.—In the order of their importance they are: (1) Empyema; (2) extension of infected area about abscess; (3) flapping of mediastinum which brings about an antelectatic condition of the lung on diseased side; (4) haemorrhage; (5) infection of chest wall, cellulitis, osteomyelitis, etc.; (6) bronchial fistula; (7) paralysis. The chance of the occurrence of most of these complications can be lessened, if not entirely eliminated, by careful attention to detail.

THE SURGICAL TREATMENT OF CEREBRAL CONDITIONS CAUSING INTRACRANIAL PRESSURE*

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THE task which has been set me to-night is a most difficult one and had I chosen the title it would have been "The Surgical Treatment of Intracranial Pressure," for in my experience it is easier to treat intracranial pressure than it is to know exactly what cerebral conditions cause it. The surgical treatment aims firstly at the relief of the pressure and secondly at the removal of the cause if such be possible, so that the treatment of the cerebral condition is secondary to the treatment of the pressure. If the order of treatment were reversed, the opportunity of affording relief of pressure would undoubtedly be lost, in a majority of cases, in an endeavour to ascertain the exact nature of the condition.

Our knowledge of the anatomy and physiology of the brain gives us an understanding of the ease with which intracranial pressure may occur, and also how nature has endeavoured to safeguard it against the possibility of such

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an occurrence by dividing the cranial cavity into three compartments by means of the falx cerebri and the tentorium, and by affording an outlet for the cerebro-spinal fluid into the spinal canal, an assisting factor whereby 3 to 6% of the cranial capacity may be encroached upon without the onset of pressure symptoms.

In order to facilitate the outline of surgical treatment the intracranial pressure may be divided into two large classes according to the duration of the onset: (1) Rapid intracranial pressure from injury with haemorrhage or oedema; (2) Slow intracranial pressure from tumour.

1.—*Rapid intracranial pressure*—In head injuries four-fifths of the patients suffer from shock which must be treated first no matter how severe the injury. Even when a large haemorrhage has occurred at the time of the injury, the low blood pressure attending the shock prevents any further haemorrhage. If the patient does not survive the shock the injury was of such a severe nature as to exclude the possibility of any aid which might have come from a decompression operation. Non-operative treatment in mild cases, which comprise about two-thirds of all patients, is usually successful, while operative treatment is necessary in the remaining one-third. In the mild cases the injury may have given rise to extra-dural haemorrhage with some laceration or contusion of the brain, the latter accounting for the pressure; or a small subdural haemorrhage, a laceration or contusion producing a limited degree of oedema, or a combination of all has occurred. In the severe cases a large subdural haemorrhage, or an extensive laceration and contusion with odema, or both have occurred. A consideration of the force producing the injury may aid one in estimating the extent and variety of the lesion. A direct blow or fall from a height will always produce more laceration and contusion than a compressing force. In a direct blow the injury due to contre-coup is often the major lesion and the laceration and contusion give rise to varying degrees of oedema. It is the oedema which gives the gravest concern and it is the oedema involving the medulla which causes the death of the patient.

After the patient has recovered from the shock, as indicated by the blood pressure and pulse, the decision for a decompression operation is based upon the condition of the retina and the cerebro-spinal fluid pressure. When there is a rapid increase of this pressure above 16mm. of mercury as indicated by lumbar puncture and the mercurial manometer; when the discs show oedematous obscuration to the degree of an early papilloedema; and when increasing paralyses of the extremities occur along with the usual symptoms, there should be no hesitation in operating immediately. To delay operation at this stage would be to court the onset of a medullary oedema and collapse.

If, after the shock has been relieved, these signs and symptoms which determine operation are absent, the case is a mild one and the careful withdrawal of 10 c. c. of the cerebro-spinal fluid may give great relief. This procedure may be repeated 5 or 6 times at varying intervals and as much as a total of 50 to 100 c. c. withdrawn. When operation is not indicated the withdrawal of the cerebro-spinal fluid is accompanied by other forms of palliative treatment which aim at securing rest, cold to the head and catharsis. In a severe case, however, the attempt to withdraw a quantity of cerebro-spinal fluid by lumbar puncture when the pressure is 16 to 20 mm. or higher may prove fatal by the sudden compression of the medulla in the foramen magnum.

In this first class, then, the decision for operation depends upon the eye changes and the cerebro-spinal fluid pressure. Other signs and symptoms may, or may not, be of value in making the decision.

2.—*Slow intracranial pressure.*—The tumours producing a slow onset of intracranial pressure are the sarcomata, endotheliomata, the fibromata and the carcinomata. The glioma is an infiltrating tumour and seldom gives rise to intracranial pressure. A cyst may be the cause, or tuberculomata or syphilomata. These tumours produce a direct compression force which increases up to the point where an invasion of the brain substance occurs. Any of them may also be complicated by the presence of an internal hydrocephalus due to a blocking of the veins of Galen or the prevention of the normal transudation from one ventricle to another.

The surgical treatment of tumours depends upon the ability to locate the position of the tumour. When the tumour is diagnosed in a

certain area the procedure is a radical operation which aims at the removal of the tumour. When, however, the tumour cannot be definitely diagnosed, a subtemporal decompression is undertaken for the alleviation of the symptoms caused by the intracranial pressure of which sight, headache, fits, and emaciation from vomiting rank in the order of their significance. In this second class where the pressure is of slow onset the decision for operation rests mainly upon the eye changes.

Operative Procedures

Subtemporal Decompression.—This operation is undertaken for injuries with haemorrhage or oedema and for tumour or other conditions producing pressure when the condition cannot be definitely diagnosed.

The advantages of the subtemporal operation are:

(1) It is the silent area of the brain.

(2) The squamous bone is thin.

(3) It is the most frequently involved area. Bony lesions so frequently occur in the middle fossa and cerebral contusions are especially liable to involve the tip of the temporo-sphenoidal lobe.

(4) There is no danger of paralyses following protrusions of the brain through the opening.

(5) The temporal muscle makes possible a firm closure and more support.

(6) The exposure of the meningeal territory and the ease of determining the presence of an extra-dural haemorrhage.

A vertical incision is best as the temporal artery is secured where cut and, unlike the curved incision its many branches are left intact. It ensures an easier enlargement of the bony opening downwards and the strong attachment of the temporal muscle to the parietal crest is preserved.

When the operation is undertaken for tumour, the decision to explore the brain through the decompression opening must be governed by the patient's condition. In the presence of certain injuries, abscess or hydrocephalus drainage must be instituted.

In the absence of other indications the decompression is undertaken on the right side so as to avoid any possible injury to Broca's area.

Radical Operation.—This operation is performed when a tumour has been definitely diagnosed. Sir Victor Horsley stated that the palliative operation of decompression should be the exception and radical operation the rule in brain tumours. Many tumours cannot be definitely localized, however, and time must not be lost in the attempt, especially when optic atrophy is imminent.

The choice between craniotomy and craniectomy must be determined by the location of the tumour and the size of the proposed opening. When the surgeon wishes to expose a large area in relation to the motor area the bone-flap operation should be done. When, however, time is a serious consideration, and when operating in the cerebellar region, craniectomy must be done.

In certain cases where the patient's condition is poor, the operation may be divided into two stages, the first ending at the dura mater. The second is then undertaken within a week.

When the dura is exposed it may show loss of pulsation; it may be anaemic from pressure, reddened from vascularisation, opaque from the presence of an underlying cyst, plum-colored from subdural haemorrhage; it may be oedematous, adherent, or gray-brown from the presence of a malignant mass. Fluctuation suggests cyst while increased solidity points to a tumour.

After the dura is opened, exploration should be undertaken only when the diagnosis is reasonably certain.

If the tumour when found is extensive with ill-defined margin, it should be left and the surgeon should remain content with relief of the pressure. If he has employed a bone flap, he may cut a circular area from the inferior border of the flap to ensure a relief of pressure and then replace the flap.

When a circumscribed tumour has been shelled out, light packing with dry plain gauze may be necessary to control the bleeding. When a cyst cannot be removed intact, the wall should be dissected out when possible.

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SOME CEREBRAL MANIFESTATIONS OF GENERAL INFECTION*

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CERTAIN of the cerebral manifestations of infections such as delirium create but little interest, the experience of the ages having taught us that we can never correlate the delirium with the anatomical findings; certain others such as coma and convulsions, in adults at least, interest us in that they increase the gravity of the prognosis and upset our calculations for the autopsy table but little less often. For these reasons we find that it is with the more sharply localized manifestations or with manifestations more clearly psychic that the bystander most concerns himself.

An integral part of clinical medicine, the cerebral manifestations of infections have been frequently dealt with, and their causation ascribed to many conditions, such as the height of the fever, the presence in the blood of urea in increased amounts, or coincident nephritis or nephrosis. An observer of 60 years ago, C. H. Bastian, was convinced that plugging of cerebral vessels with thrombi explained all nervous symptoms. Murchison is clear, however, in his statement that "the severest nervous symptoms may be seen in cases whose brains showed little or nothing to a practiced eye," and the remarks of Stokes, the then celebrated student of the fevers of Dublin might well be remembered to-day—"Symptoms of inflammation of the brain do not necessarily indicate inflammation if the case is one of typhus, even such symptoms as inequality of pupils, strabismus, muscular rigidity, and perhaps opisthotonus may be present without inflammation."

To-day perhaps, our ability to detect conditions in the cerebro-spinal fluid has helped to explain some of the many cases with a meningeal syndrome, and the finer histology has given us the recognition of vascular and peri-vascular changes in such conditions as syphilis, encephalitis, and polio-myelitis, without evidence of gross changes. We are the further advanced by these improvements; nevertheless, the uncertainty of being able to demonstrate lesions to correspond to symptoms of cerebral involvement still exists; there is this comforting fact, however, in the consideration of many of the cerebral manifestations of general infections—the most severe symptom may be recovered from.

The common infections seen in a general hospital—the pneumonias, typhoid, influenza, septicaemias, rheumatism, and erysipelas have a varied assortment of cerebral manifestations; meningitis, common to all, (especially to the pneumonias and to the septicaemias), I am not considering, its very evident group of symptoms and the results of lumbar puncture usually dispel doubt. The appellation "meningism" well describes the condition we frequently see in the infections—active meningeal symptoms with clear spinal fluid under pressure and with increased cell count. This must be considered as meningeal irritation at least, though often only part of a general process of infection and very frequently recovered from. In cases ending fatally, singularly little may be found. In the respiratory infections, aside from delirium, the cerebral manifestations are few and the anatomical findings fewer. In no type of infection is the diagnosis of cerebritis or meningitis so often made, especially is this the case in children; the difficulty is in these cases to observe both the clinical course of the disease and the brain sections; amongst 120 cases actively delirious, I have recorded one with rigid neck, internal strabismus, and recovery; one with rigid neck, positive Kernig and Babinski sign, with recovery; one with rigid neck, the same positive signs, death, but no meningitis. Clear spinal fluids were found in all these cases.

Coma as an early cerebral manifestation of respiratory infections is unusual, and was a fatal sign in all of eleven cases beginning in this way; convulsions, early or late, were equally ominous, in adults. Four convulsive cases all died: one, with the typical signs and

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symptoms of meningitis in addition, showing, however, only the familiar oedema and congestion of the brain: no exudate, no organisms. A second showed flaccid paralysis of an arm and deviation of the eyes with his fatal convulsions, presenting a combination suggestive of some more localized pathological change. Psychic manifestations at onset, so pronounced that they separate themselves from the simple febrile delirium and the signs of the infection, are rare. Two instances of delusions of persecution were in my series, another was diagnosed as "dementia precox developing in an epileptic." We are more familiar with the forms seen after crisis or lysis, "post critical delirium or psychosis." These are by no means uncommon and they are the more protracted if the case has had an alcoholic history. Ptosis, amblyopia, lethargy and nystagmus were unusual and transient manifestations occurring once each in a series of 350 cases: the two first would probably be considered as peripheral lesions.

There is no convincing pathology to offer; thrombosis, rare in pneumonic infections, is suggested in the case showing convulsions and monoplegia;—later case with rigidity of the left arm, paresis of the left side of face and semi-consciousness, went on to abscess formation in the lungs: there were thromboses of the peripheral veins in this case and thrombotic softening of part of the right cerebrum. No good instance of encephalitis (diffuse or focal), embolism, or haemorrhage, proven by autopsy, has occurred in my series; both encephalitis and haemorrhage are recorded, however, in respiratory epidemics such as have been seen of late.

The last hundred cases of typhoid in the Toronto General Hospital have shown singularly few cerebral manifestations apart from the early delirium, nor have I found specimens illustrating the thrombosis, meningitis or encephalitis which Osler considers the common anatomical changes in the cases with marked cerebral involvement. One case of deafness occurring early was considered a peripheral lesion, a neuritis, and was recovered from; it occurred coincident with a fatal laryngeal and and pharyngeal paralysis; the direct cause of the paralyses in this latter case remained unproven in the absence of autopsy. Such conditions are referred to by the older writers and considered as analogous to the lesions of diphtheria. The following history illustrates one of the most severe cerebral manifestations of typhoid with a definite localization:—In the third week of a severe typhoid when the fever was subsiding, Mrs. A., 35 years of age, began to develop rigidity of her neck: her right arm and leg became rigid and she was quite unable to make more than a few incoherent sounds: after ten days of added delirium and weakness there was a gradual improvement and she went out recovered (save for some slight stiffness) and able to speak. Similar conditions are referred to more frequently in the course of typhus fever; they are considered as due to thrombosis, arterial or venous, and many good examples of this have been demonstrated. In the experience of some observers a focal encephalitis has seemed to be the cause. Not every case recovers as completely as did the one reported, for permanent rigidity and paralysis may remain. I have had no experience with the temporary aphasia reported in the typhoid infections of children.

No discussion of cerebral manifestations of typhoid is complete without a detail of the psychoses of this infection; their occurrence as an early delirium, as an aberration later in the fever, or as a condition in convalescence may be mentioned; they do not depend upon the severity of the attack. Dr. Rudolf allows me to describe an interesting case from his service:—Richard A., with a severe infection became fatuous, childish and tearful as his temperature fell; he was increasingly so in convalescence. A gall-bladder infection developed and later he relapsed: with the relapse active delirium for a few days, but as he cleared up he was seen to be free from his fatuity and quickly became normal. These psychoses are noted as usually being recovered from, though at times their course may be prolonged. Of unusual interest in the typhoid series was the development of typhoid in a case of chorea; the choreiform movements subsided as the disease progressed (case of Professor Rudolf).

It was expected that the influenza epidemic of 1919 would give us many instances of brain involvement; in this we were mistaken, for apart from the delirium of the severe and fatal cases, few nervous manifestations were seen. The supposed dependency of encephalitis upon preceding influenza was considered in this connection, and in the three hundred cases nervous signs and symptoms were regularly looked for.

In a few patients transient weaknesses of the eye muscles were observed, some pneumonics showed the meningeal irritation so often referred to, but real cerebral involvement was not a part of the last epidemic.

With the various septicaemias and with rheumatic fever are seen the best examples of real cerebral changes. The older descriptions of encephalitis, the forms distinct from the lethargic encephalitis, deal largely with lesions seen in the endocardial cases or in cases of acute sepsis; leaving aside the symptoms due to large emboli, we find many interesting histories.

A.—In one case paresis of legs, diplopia, ptosis, divergent squint and lethargy followed an active diverticulitis and abscess of the rectum, which in turn had seemed to follow upon an infected hand; weeks of unruliness and childishness ensued and there were, in addition, remarkable spasms of the abdominal muscles—a persistent white cell count of 20,000—40,0000, seem to indicate active infection. There was complete recovery.

B.—Two weeks of extreme restlessness with severe hyperaesthesia, confusion, then coma, with left facial weakness, was the history in a case with extensive endocarditis of mitral and aortic valves due to a staphylococcus aureus infection; multiple embolic abscesses were found in the brain sections.

C.—Headache, aphasia, and staggering gait preceded by some days the hemiplegia and unconsciousness in another case of mitral and aortic endocarditis with streptococcus haemolyticus infection: gross haemorrhages and pinpoint haemorrhages throughout the brain were the findings. These are the types of cases in which the extensive sub-arachnoid haemorrhages are prone to occur.

Coma, long recognized as a symptom of endocarditis, was only noted as late-occurring in the cases I have been able to review and to control with an autopsy record; mania of four weeks' duration preceded death in one case of the subacute form of bacterial endocarditis, and for months previous, this very powerful man had suffered from phobias of unusual sorts and would wander lost for days. Of the cases with distinct rheumatic history and endocarditis, and with careful post-mortem examinations, two may be detailed.

1.—A young woman with recurring attacks of acute rheumatism and a mitral valve lesion, became very irrational, had delusions and would wander from home. Two months after these mental features had been noted she had another attack of acute rheumatic fever, she was emotional, had active delusions, and after a few days became delirious and died. At autopsy, mitral endocarditis, oedema and congestion of the brain, with an area of softening posterior to the caudate nucleus were found.

2.—A woman of 53 with a history of repeated rheumatic attacks entered the hospital in a state of absolute coma. There were no paralyses; for two months she had been worrying, had been excitable and had had delusions; a loud systolic murmur was evident on examination; a rheumatic endocarditis, multiple petechial haemorrhages in the brain, and a haemorrhagic pachymeningitis was found. These cases showed nothing bacteriologically.

One may recognize from these details that cerebral manifestations of various sorts are to be looked for in many of the infections, their pathology is evidently very varied and their seriousness would seem to depend much more upon the nature of the infection than upon the symptomatology.

The following examples of the cerebral pathology in some infections, were prepared by Dr. E. L. Robinson, of the Pathological department, Toronto General Hospital.

PLATE 1.—From a case of general infection beginning with an anthrax pustule on the face. Signs of a general infection—fever—then absolute unconsciousness. Large sub-arachnoid hemorrhage over whole of cerebrum, myriads of punctate hemorrhages. (From a case in the service of Dr. H. A. Bruce).

PLATE 2.—Severe malarial infection. Patient in coma with fixed pupils; multiple emboli of parasites and pigment containing cells in the minute vessels of the brain. (Specimen lent by Prof. W. G. Macallum of Baltimore).

PLATE 3.—Case supposed to be an alcoholic; restless and irrational for weeks; marked hyperaethesia, fatal coma; extensive endocarditis of mitral and aortic valve due to staphylococcus aureus infection; embolus of the left middle cerebral artery, sub-arachnoid hemorrhages, thrombus of right lateral sinus, multiple areas of minute pyemic encephalitis. (Service of Professor Duncan Graham).

PLATE 4.—Case of headache, asphasia, staggering gait for some days, then sudden hemiplegia of right side, unconsciousness: profuse mitral and aortic endocarditis, extensive sub-arachnoid hemorrhages, multiple minute hemorrhages in brain with no sign of reaction. (Service of Professor Duncan Graham).

PLATE 5.—Case of fever, weakness and paresis, and finally paralysis of all extremities and muscles, considered as encephalitis. At autopsy, endocarditis, multiple minute thrombi throughout brain. (Service of Professor Duncan Graham).

ANAESTHESIA AND ANAESTHETICS

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PERHAPS in no department of medicine is there greater need of co-operation and mutual reliance than between surgeon and anaesthetist. Nothing can be more trying to the surgeon than to be uneasy in his mind, or actually interrupted in his work over questions relating to the anaesthetic. On the other hand, an anaesthetist who feels that he enjoys the surgeon's trust is in a happy position to devote his entire attention to his own duties and responsibilities, which, while they are usually light as compared with those of the surgeon, are none the less real to the anaesthetist. A discussion of some of the points upon which the interests of surgeon and anaesthetist meet, should, I feel sure, be of mutual benefit.

Not a great while ago the opinion was expressed that local anaesthetists do not use chloroform frequently enough. Chloroform has usually been regarded as more dangerous than ether, on this continent, and its chief advocates appear to have been in Britain. That there is some heart-searching going on there, the literature of the last two or three years would seem to indicate. Last year Levy[1] published a monograph on chloroform anaesthesia, which defines very clearly the present status of this drug. Levy says: "The ventricles of the mammalian heart are in an irritable condition when affected by chloroform. This irritability is most marked when they are lightly affected by chloroform, and is progressively diminished under conditions of deepening anaesthesia. When thus made irritable, extra systoles of ventricular origin are easily evoked by (1) conditions which stimulate the ventricles, (2) conditions which remove or reduce depressing influences, and are thus the equivalent of a stimulation." Bearing in mind that the vagus is depressor in action and that the cardiac sympathetic fibres are pressor or accelerator, let us consider the effect during light chloroform anaesthesia, that is with already irritable ventricles, of the action of such a substance as adrenalin. Adrenalin stimulates the myoneural junctions of the cardiac sympathetic fibres. In the cat, under light chloroform anaesthesia, 1 minim of 1-1000 solution of adrenalin injected intravenously, produces an intense ventricular tachycardia, which almost always terminates in ventricular fibrillation. While the human heart is probably not quite so susceptible, there is a case on record where the injection in the nose of adrenalin for a nasal operation during chloroform anaesthesia, produced fatal ventricular fibrillation. Apart from the exhibition of adrenalin therapeutically, it is well to remember that emotions and strong sensory stimuli, such as may occur during an operation, result in an outpouring of adrenalin into the circulation.

Another point: most of our patients have received a preliminary injection of morphia and atropine when they reach the operating room. So far as morphia goes, it depresses the respiratory centre, and tends to induce cyanosis under chloroform. Atropine depresses vagus action. The vagus diminishes the irritability of the ventricles. If vagal tone be abolished, the ventricles are more ready to pass into an irregular tachycardia and subsequently to fibrillate. Consequently the use of chloroform after atropine carries with it an additional risk.

The danger of ventricular fibrillation is slight, it is true, under full chloroform anaesthesia, and clinical experience confirms this, but no way has yet been devised of obtaining that degree of anaesthesia without the genuine dangers present during induction and recovery. The points which Levy emphasizes are: 1.—The condition is more prone to occur during light anaesthesia, hence during induction, recovery, and under C.E. and A.C.E. mixtures. 2.—That strong sensory stimuli may precipitate it. This includes operative procedures, the reapplication of chloroform after administration

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has ceased, and recovery commenced. 3.—The injection of adrenalin.

It must be remembered that this is not chloroform overdosage. An overdose depresses the respiratory centre and induces asphyxia, and, as a rule, the heart continues to beat vigourously for some time under this condition. Withdrawal of the anaesthetic and artificial respiration will result in recovery. In ventricular fibrillation, the circulation is arrested, the blood pressure drops immediately, and death comes at a stride. I am sure that some present have seen, as I have, this phenomenon. A few drops of chloroform, fifteen or twenty minims, to a patient who has scarcely lost consciousness, a rapid irregular pulse, a blanching of the face, and respiratory failure that defies all efforts to re-establish it.

We used to think that by combining ether and chloroform, the desirable features of each were retained, while the undesirable effects were more or less mutually counteracted. In the light of Levy's work, such mixtures are even more dangerous than pure chloroform. The mortality figures given by Levy tend to confirm this, since while the total deaths remain fairly constant, those from C.E. have increased. The same objections can be raised to an induction under chloroform, followed by ether.

Gentlemen, I am convinced that chloroform has had its day, and that like the sawdust and the carbolic spray, it should be relegated, not without honour, to the past of surgical history.

There are a number of conditions occasionally requiring major operations, in which the choice of an anaesthetic is important.

Pulmonary tuberculosis.—Let me say definitely that inhalation anaesthetics will almost always aggravate a pulmonary lesion and may convert a favourable case into an unmanageable one. Occasionally patients with *glycosuria* require operation. In the first place patients with diabetes mellitus do not stand inhalation anaesthetics well. Certainly before any operation is undertaken an attempt should be made to determine whether or not the case is true diabetes, and, if so, to get the patient sugar free. This seems so obvious that one would hesitate to make such an observation if experience did not show there is room for it. If the case is diabetes mellitus, ether and chloroform are more likely than not to induce coma. Gas and local offer the best hope.

We do not make a practice of giving routine preliminary medication to children, although we see every day the benefit in adults, and it is not at all unusual to have a child cyanosed from a large quantity of mucus secreted.

Atropine is well borne by children, even as young as two years, and the benefit is believed to offset the distress occasioned by giving a hypodermic injection to a little one.

In some classes of cases the giving of *saline interstitially* has become practically a routine, notably in goitre operations, and we have remarkably little trouble. Nevertheless I believe we could and should use the rectal route more frequently, particularly in asthenic patients.

Cases occur from time to time in which vomiting is present—cases of intestinal obstruction, acute appendicitis, and so on. These cases should have a stomach tube passed before being anaesthetized. The danger of death by asphyxia from aspiration of vomitus is always present, and aspirated vomitus invariably sets up a very grave broncho-pneumonia. I do not believe it should be left to the anaesthetist to carry out stomach lavage in these cases.

Ether oil per rectum has proved very useful in cases where, for various reasons, the ordinary methods are not available. In these cases it is essential that the bowel be well prepared beforehand, and when this has been done there are no unpleasant sequelae.

One hears from time to time of ether pneumonia. I have thought it worth while to review the literature bearing upon this condition, and to examine the records in the General Hospital.

Whipple[2] reports a study of post-operative pneumonitis in the Presbyterian Hospital, New York. During 1915-16, in 3719 patients operated upon, 97 cases of pneumonitis occurred. As an aid in diagnosis, free use was made of the x-ray, and this frequently showed areas of consolidation some time before physical signs were present. As etiological factors he lists: 1.—Local inflammation in the upper respiratory tract. 2.—Vasomotor changes causing a congestion of the pulmonary vessels. 3.—Factors inhibiting the normal thoracic and abdominal respiratory movements. 4.—Local or general infections elsewhere than in the respiratory tract. 5.—Debilitated states. 6.—

Factors increasing the virulence of the inciting organisms. He emphasizes the fact that a hospital nightshirt and hospital bedclothes are frequently much lighter than the patient is accustomed to. A hospital blanket sometimes will not cover feet and shoulders simultaneously. Further, the temperature and ventilation, while excellent, often differ radically from the conditions under which the patient is accustomed to sleep. Cold draughty corridors may play a part during the patient's trip to and from the operating room.

Decker of Pittsburg[3] states that one case in forty-five operated upon developed some respiratory tract lesion, and that one in two hundred dies. He regards pneumonia as by far the most frequent lesion, amounting to 75% of the complications. He distinguishes between cases arising in the first 48 hours, and those developing later, regarding the first class as much the more serious.

W. J. Mayo in a foreword to Labat's textbook on regional anaesthesia states that apart from exudative conditions pre-existing in the respiratory tract, there is reason to believe that many post-operative pneumonias are embolic in origin.

The records of the Vancouver General Hospital show that during 1922 there were 4,528 major surgical and gynaecological operations upon approximately 2,800 patients. These patients are seen post-operatively by the Assistant Superintendent at intervals during their stay in hospital, and it is from his notes on any complications developing after anaesthesia that I have been able to arrive at the following figures.

Twenty-eight cases developed clinical evidence of broncho-pneumonia or lobar-pneumonia post-operatively. Of these, five cases developed symptoms from nine to sixteen days after the operation, the attack being ushered in by headache, chills, coryza, etc. They appeared in every way to have been due to an infection of an influenza character and did not appear referable to the operation or the anaesthetic.

Of the remaining twenty-three cases, the ages ranged from 6 years to 56 years, the majority being people of 30 to 40 years. Four cases occurred in January, 1 in February, August and September, two in March, November and December, while ten occurred in October.

In thirteen cases the routine physical examination showed no evidence of any trouble; in two cases cough only was present; in seven cases there was evidence of a respiratory lesion and in one case no note was made. The operations followed by trouble were as follows:—hernia, five cases; gastro-enterostomy, three cases; gall-bladder, three cases; appendectomy, three cases; perineal repair and laparotomy, three cases; and 1 each of the following: salpingectomy, epididymotomy, nerve-suture, Caesarean section and prostatectomy. The onset of symptoms was in three cases immediate; in six cases, twelve hours; in four cases, twenty-four hours; in eight cases, forty-eight hours, and in one case, three days. The duration was in sixteen cases, four to eight days; in two cases, less than four days; in four cases, one to two weeks; in one case, a month. In two cases the condition contributed materially towards a fatal outcome. In one of these there was no evidence pre-operatively of a chest condition; in the other, cough and expectoration, without physical signs, were present. The anaesthetics employed were:—ether, seventeen cases; chloroform, one case; C.E., three cases; gas and ether, one case; local, one case. The fact that nearly half the cases occurred during one month, at a season when respiratory ailments are common speaks for itself.

While a comprehensive study of these cases is not possible, one is justified, I think, in drawing some conclusions. First, that the incidence is mainly seasonal. Second, that the anaesthetic agent is not the principal factor. Third, that evidence of an inflammatory process in the respiratory tract should contra-indicate any elective operations. Fourth, that a routine physical examination is of real value.

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POST-OPERATIVE TETANUS

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TETANUS is probably the most ruinous complication which can follow any surgical procedure, not only because of the high percentage of mortality, but on account of its cruel method of bringing about death, usually in from one to four days. Two of the Hippocratic aphorisms express tersely the general prognosis even at the present day. "The spasm supervening on a wound is fatal" and "Such persons as are seized with tetanus die within four days, or, if they pass these, they recover."

While the prognosis given in the above aphorisms may have improved since the use of tetanus antitoxin in the treatment of open wounds, tetanus following operative or closed wounds is fatal in more than 75% of the cases, and while it is impossible to prove definitely the source of post-operative tetanus in all instances, yet statistics of reported cases point to one common source—the suture material; but these must be considered in conjunction with the bacteriology, pathology, surgical technique, and the nature and preparation of the suture material.

I wish to divide this paper into three parts; the first, an historical review; the second, the suture material; the third, the experimental work which we have carried out.

Historical Review

The bacillus of tetanus occurs in nature as a common inhabitant of the soil, being abundant in many localities—not only in the superficial layers of the earth but also at a depth of several feet. Writers mention various places where it has been found, such as dust in houses, streets, gardens, in hay, manure, and the excreta of animals. It has been found, according to one writer, at the bottom of mountain lakes in Switzerland, in the draggings of the Dead Sea, and in the arrow poison of certain savages in the New Hebrides, who obtained it by means of smearing their arrow heads with dirt from crab holes in the swamps. It is an anaerobic, moderately motile bacillus, forms spores, and in the spore stage is not motile. It grows best at a temperature of 38°C, when, within 24 hours, it forms spores. It will not, in pure culture, grow in the presence of oxygen, but with certain other bacteria the tetanus bacillus grows luxuriantly even when oxygen is present. The spores of the tetanus bacillus are very resistant to outside influences; in a dessicated condition they may retain their vitality for several years and are not destroyed in 2½ months when present in putrefying material. Sir William Osler[12] writes of an experiment that was carried out, when from steel nibs dipped in tetanus culture in 1891 a growth of virulent bacilli was obtained, from one in 1902 and from the other in 1909—eighteen years later. Parke & Williams[13] report that Henrijean, who by means of a splinter of wood which had caused tetanus, was able after eleven years to produce the disease by inoculating an animal with the same splinter.

Pathogenesis.—In mice, guinea pigs, rabbits, horses, goats, and some other animals, inoculation of pure cultures of tetanus bacilli causes typical tetanus after an incubation of from two to three days. Rats and birds are but little susceptible, and fowls scarcely at all. Man is more susceptible than any of the other animals so far tested.

It is a remarkable fact that an amount of tetanus toxin sufficient to kill a hen would suffice to kill 500 horses. On the inoculation of less than a fatal dose in test animals, a local tetanus may be produced which lasts for days and weeks and then ends in recovery. On killing the animal, there is found at autopsy, just at the point of inoculation, a haemorrhagic spot, and no changes in any other organs. A few tetanus bacilli may be detected locally with great difficulty, often not at all. Possibly a few may be found in the region of the neighbouring lymphatic glands. From this scanty occurrence of bacilli, the conclusion has been

reached that the bacillus of tetanus, when inoculated in pure culture, does not multiply to any great extent in the living body, but only produces a lesion through the absorption of the poison which it develops at the point of infection. It has been found that pure cultures of tetanus, after the germs have sporulated and the toxins been destroyed by heat, can be injected into animals without producing tetanus; but if a culture of non-pathogenic organisms is injected simultaneously with the spores, or, if there is an effusion of blood at the point of injection, or if there were a previous bruising of the tissue, the animals surely die of tetanus. Even irritating foreign bodies have been introduced with the spores deprived of their toxins, and tetanus did not develop, but if the wound containing the foreign bodies became infected with other bacteria, tetanus developed and the animals died. From such experiments it seems that a mixed infection aids greatly in the development of tetanus, when infection is produced by spores not accompanied by tetanus toxin.

Tetanus in man.—Although rather deep wounds are usually the seat of infection, at times superficial wounds, as an acne pustule, or a vaccination, may give the occasion for the infection. It should be borne in mind that, where there is no external or visible wound, there may be an internal one, yet I fail to find in the literature any instance of tetanus occurring in typhoid fever, where one would expect to see it as a complication, if intestinal infection is to be considered. Sir William Osler[12] enumerating the complications of typhoid fever says "true tetany occurs sometimes and has been reported in connection with certain epidemics," but he does not mention one single instance of tetanus occurring in typhoid fever.

Toxin of tetanus bacilli.—It is evident from the localization of tetanus bacilli at the point of inoculation, and their slight multiplication at this point, that they exert their action through the production of powerful toxins. Sir William Osler[12] states that tetanus toxin is possibly the most virulent of known poisons. The lethal dose of cobra venom in comparison requires 4.375 m.g., strychnine 30-100 m.g., anhydrous prussic acid 54 m.g., tetanus toxin 0.23 m.g. to a man of 70 kilos weight. At this rate, one grain of tetanus toxin is fatal to 281 people. Browning[4] states that the horse and human are equal in susceptibility, and that a subcutaneous injection of concentrated toxin of 0.003 cc. is fatal to a horse. Muir & Ritchie[11] state "the enormous potency of such a poison explains how, even in a fatal case, extreme smallness of the wound and difficulty in isolating the bacillus, do not detract from the theory that the latter is the cause of the disease. Dieulafoy[6] states "the toxin does not spread through the blood stream. The intravenous injection of tetanus toxin must be 8 to 10 times as strong as the subcutaneous injection in order to produce death, because the poison travels almost exclusively along the nerves to fix itself in the cells of the spinal cord or in the bulb."

Rapidity of absorption of tetanus toxin.—After the absorption of the poison there is a lapse of time before the effects are noticed. With an enormous amount, in about 12 hours—with ten fatal doses, 36-38 hours—with two fatal doses, 2-3 days. Less than a fatal dose will produce local symptoms. If a minute quantity of tetanus toxin is injected into the end of a rat's tail, and the tail is amputated 45 minutes after, the amputation will not save the animal. One experimenter accidentally pricked himself in the hand with a hypodermic needle which was simply moistened with toxin, and in three days developed all the symptoms of the disease.

The following remarks of Dr. Vaillard[21] although they may in some respects repeat statements already made in this paper, are quoted verbatim in order to emphasize some important features.

"Tetanus, common to man and domesticated animals, was formerly a very wide-spread disease. In surgery tetanus claimed daily a large tribute from those operated on. I will only quote examples taken from your medical literature. Lynd reports that in India, out of six cases of amputation, five died owing to this complication. Wallace in 1882 stated in *The Lancet* that out of 2148 important operations carried out at the Calcutta Hospital, 43 died of tetanus, *i.e.* 2%. According to Keely *Annals of Surgery*, 1888, during the years preceding 1881, the tetanus mortality was so extraordinary at the West London Hospital after operations or complicated fractures, that the hospital medical council had to take steps to arrest such a scourge. The bacillus never spreads itself in the infected organism; it localizes itself exclusively at the seat of the wound, in the pus which forms there, in the superficial layer of the purulent pocket, and develops only there. It is therefore alone in the wound, sometimes very insignificant, that the microbe creates the poison and which, reaching the central nervous system by the blood and nerves, causes the symptoms of tetanus. It can also be said that amongst all poisons known, microbian and other-

wise, there is none than can be compared with it. The spores of the tetanus, as we know, are extensively disseminated around us. On the other hand, the circumstances under which they can be brought into contact with injured tissues are numerous, and yet, in spite of these eventualities which it seems must increase the chances of infection, tetanus remains a rare disease for all this.

"The reason is, as has been established by a multitude of researches, that the penetration of the tetanus bacillus in a wound does not always conclude the etiology of the disease and loes not suffice *ipso facto* to cause its outbreak. In addition to this, certain conditions are necessary before the disease asserts itself; and it is because they must be simultaneous with several factors, that tetanus is of rare occurrence. I must therefore summarily state the principal facts on which this pathogenic conception of the disease is based. The first point is fundamental: The tetanus spores taken from a culture and freed from the toxin which they have created, are harmless when they are injected by thousands, and even by millions into the healthy tissues of an animal, provided they are in a pure state."

This last statement is corroborated by the Medical Research Council (National Health Insurance) of England, by Sir D. Semple[18] *et al.*

"These spores, deprived of any pre-existing toxin, do not grow and do not cause the disease, because as soon as they are introduced into the system they are taken into and rendered immobile and then destroyed by the phagocyte cells. As proof of this, the same spores introduced in infinitesimal quantities in the same tissues grow very well and cause tetanus when they are artificially protected against the phagocytes. The following experiment will show this:—the guinea pig resists a subcutaneous or intraperitoneal inoculation of a number of germs estimated at more than two millions for certain experiments; but it will certainly die of tetanus if it is inoculated with a few isolated spores mixed with very fine sand which is enclosed in a small, well-closed piece of Berselius paper, thus forming a sufficient barrier between the microbes and the phagocytes. The latter do not reach the spores as they are prevented by the thin layer of paper. The spores grow and become bacilli; the latter secrete their toxin which easily diffuses through the paper membrane and causes tetanus. Consequently is one not led to think that the spores introduced into a wound with particles of dirt can only infect man or animals if the circumstances permit them to escape from the destructive activity of the leucocyte cells?

"I mentioned above that an animal can be injected with impunity with a considerable number, sometimes millions of tetanus spores, pure and deprived of toxin. A like innocuity contrasts strangely with the fact that the animals die of tetanus when they are inoculated subcutaneously with a few milligrams of earth, although the number of germs contained in it is extremely small and probably not more than a few units. On the other hand, human tetanus comes on in circumstances where the wound could not have been contaminated by a quantity of tetanus spores equal to the number which small animals easily tolerate. We must therefore admit that in every case where the disease comes on after experimental or accidental infection of a wound by the soil or other virulent product, the spores receive help of some sort which has enabled them to grow. The pathogeny of tetanus in natural infection appears then to be a complex phenomenon which, in order to take place, has to have the simultaneous help of several factors; the specific germ, and favorable conditions for its growth, the latter acting either to diminish or destroy the cellular defence of the organism. There are abundant proofs of this, as experiments have enabled us to discover these auxiliary agents and the part they play. It especially shows the rôle of the nature of traumatism and even more the part of the microbian symbiosis. In animals very sensitive to tetanus, such as the guinea pig, if we reproduce various kinds of trauma, then inoculate the tissues thus injured with pure spores and without toxin, taking care to eliminate all other factors except the traumatism itself, it is found that the simple injuries, superficial, regular and aseptic, do not constitute favourable circumstances for the growth of the spores, and the production of tetanus. If, in the natural conditions of infection, tetanus comes on in such a case, either in man or in domesticated animals, assuredly a factor other than traumatism has intervened. The same thing does not happen when the tetanus spores are introduced into tissues mortified by burning or crushing, in contused and anfractuous, convoluted or sinuous wounds, or in a haemorrhage, and especially at the centre of a subcutaneous fracture between the fragments of bones; such conditions are eminently favourable to the growth of spores which then germinate without any other help. It must be remarked that in traumatisms of this nature, the leucocytes are very rare at the centre of injury, at least during a certain time. These results are in agreement with observations which have been made; tetanus rarely comes on as a result of superficial wounds, clean and regular and kept free from dirt; it complicates, by preference, burns either deep or of an extensive nature, injuries caused by crushing, where the tissues are deeply bruised and infiltrated with blood, and compound fractures. The microbian association (by which I mean the simultaneous intervention in a wound of the tetanus bacillus and different kinds of bacteria) plays an important part in the mechanism of infection. It is more often because certain microbes are introduced into a wound at the same time as the tetanus spores, that the latter can germinate, secrete the poison and produce intoxication. If a wound is contaminated with tetanus spores, but at the same time no bacteria favourable to their germination gain access, no tetanus will result; this is the reason why tetanus is rare in spite of its enormous dispersion. This rôle of microbian association in the pathogeny of tetanus conveys an idea, the appreciation of which is important in practical work."

We are not making any attempt to collect all post-operative cases mentioned in the literature, as it would be of little benefit, besides there are numerous references to foreign journals which are not available.

A summary of the findings in reported cases will show (1st) that tetanus has complicated operations of various kinds; (2nd) that details are lacking as to the suture material employed in many cases; (3rd) that P.M. findings are singularly inconclusive. The possible sources of post-operative tetanus are:— 1st—That the wound is infected from the air at the time of operation; 2nd—Infection from instruments or gauze used at time of operation; 3rd—Infection from the intestine; 4th—Infection by suture material. Considering the first—it seems a rare possibility, and if at all likely one would expect it during the summer season when dust is more common, but we find it is not a seasonable condition. As stated, experiments go to prove that the tetanus spores, in which con-

dition they would exist in dust, do not grow without protection against the leucocytes unless accompanied by other germs aiding growth by symbiosis. The incubation period is also against such a mode of infection, when it is recognized that experimental, direct inoculation, under favourable conditions, shows an incubation period of 3-4 days, whereas the majority of cases following operation have an incubation period averaging 10-12 days. A search of the literature does not reveal any instance of a submucous resection of the nasal septum being complicated by tetanus.

These same arguments are equally applicable to the second possibility of infection by instruments or gauze.

3rd—Infection from the intestine. Recorded cases of post-operative tetanus are found in only a small percentage of cases where the operation was done on the alimentary tract. In addition, if the infection took place from the bowel, it is difficult to conceive that only the tetanus bacilli would be liberated and, if a mixed infection occurred, the incubation period, as shown above, would be 2-4 days instead of the average 10-12 days.

4th—Infection by suture material. There are many points in favour of this being the actual source. We have the definite statements of the tetanus bacillus having been found in catgut. Koch inoculated mice with catgut and produced the disease. The Clinical Research Association cultivated a bacillus having the characteristics of the tetanus bacillus from catgut similar to that used in the fatal cases recorded by Jaffe[9]. In Richardson's series catgut was examined in fourteen cases and organisms resembling tetanus bacilli were found in five. Few, if any, will doubt the possibility of raw catgut being contaminated, taken as it is from sheep's intestines, under varied methods of cleansing and scraping. What other substance could be conceived of where such ideal conditions exist for the protection and subsequent inoculation as in catgut? Bacteriologists state that the tetanus bacilli, under adverse conditions as to their growth, pass into the spore stage in a time estimated at 24 hours or less, and remain indefinitely in this stage until revived under conditions suitable to their growth and activity. So far as known, age is no barrier to this property in the tetanus spore. Infected areas in the flat, untwisted sheep's intestine being granted, we can easily see that twisting is nothing more or less than close wrapping of the bacilli, which in turn pass to the spore stage, and await dehydration, adding to their protection and preservation from destruction, by either heat or chemical sterilization. The further preparation of catgut in making the larger sizes, when a number of strips of twisted intestine are used, gives a further protection, and the added treatment of chromicizing, tanning, or other hardening process, has the same effect.

For the sake of argument let us grant that catgut is the source of infection, and follow the results we know to have occurred. In spite of the fact that post-operative tetanus is a rare complication compared with the number of operations done, many factors enter to explain this rarity. First—We would hardly expect that all material used in the making of catgut was infected, or that all sheep were. It is said by one firm of manufacturers of catgut that only 10% of range sheep are infected with tetanus, and the initial cleaning, be it never so crude, might wash away the bacilli, or that only a small piece of mucosa might be left by insufficient scraping. Second—We have the report of investigators—Butterfield & Ely[5] who state that when catgut is sterilized at a less pressure than 28-30 lbs, a contaminated catgut was found and the larger the size and chromicizing, added relatively to this contamination. Third—It is not to be expected that infection in a strand of catgut would be continuous throughout its whole length, and a conservative estimate of the use of a strand of prepared catgut by any surgeon, in any operation, shows only one-half or three-quarters of any strand being used. These three groups of reasons allow, therefore, for the rarity of the complication. Statistics show that in operations where a great deal of catgut is used, or where large and chromicized strands are employed, the greatest percentage of the dreaded complication occurs. Is this in itself not significant? Following the idea a little further, we explain several important features. First, the infection arising as a pure tetanus focus, not in association with other bacteria. Is not a focus of tetanus infection in a strand of catgut fulfilling to the letter the experiments quoted by

Vaillard in which he states that a few spores of tetanus may be fatal when such spores are protected from the phagocytes of the blood until they have produced sufficient toxin to prepare their way, and is not the catgut a semi-permeable membrane, similar to the Berselius paper used in his experiment, allowing the body fluids to penetrate the catgut and supply ideal culture media to the spore, and, in turn, the toxin to diffuse outward? Second—This explains the delayed incubation period, being the time necessary to soften the hardened catgut and create activity of the spores. Third—It also explains the insignificance of the pathology found after a fatal termination, where such deadly poison has been taken up by the nervous system. Fourth—Also the difficulty of finding the tetanus bacilli after death.

Suture Material may be roughly classed into absorbable and non-absorbable. With the latter we are not concerned in this paper. Of the former catgut and kangaroo tendon are the principal materials used. This paper will be confined to the subject of catgut only. Catgut of to-day is made from the small intestine of lambs. It consists anatomically of the submucous layer, histologically connective tissue; chemically it is principally collagen with a certain amount of body salts. The origin of the use of catgut can only be surmised. The antiquity of the stringed instrument is shown by a picture of a harp in the tomb of Gyzeh of the date 4975 B.C. In the reign of Rameses III. of the 12th dynasty, 1250—1284 B.C., the stringed instrument represented by the harp reached the height of its vogue in Egyptian history, described as the most beautiful instrument ever made, inlaid with gold and silver, and carved in figures of gods, goddesses, etc. The strings of nearly all the Egyptian harps were made from the intestines of camels. Musical instrument strings made from the intestines of wolves were said to give forth harsh sounds. We do not know why the material was called catgut; as writers say, it is not likely cats' intestines were used by the Egyptians as they considered the cat a saerd animal. Marcy states that in the Odyssey the strings of the old Greek harp are described as made from the twisted intestines of sheep. Vesalius in the 16th century mentioned the ligature as a relic of the past. We can easily imagine the difficulty surgeons would be confronted with in using catgut as suture material before the days of antiseptic surgery. To Lord Lister we must give the credit for placing it on a firm basis as a useful, absorbable ligature. The properties that he sought to establish or standardize in catgut were: (1) that it should be sterile; (2) that it should be sufficiently strong for the purpose for which it was to be used; (3) that it should not be absorbed either too soon or too late. Lord Lister treated catgut with corrosive sublimate to render it sterile, and decided upon sulphate of chromium to render it sufficiently slow in absorption to suit the needs of the case. His experiments with microscopical findings of sutures, used and partially absorbed, make interesting reading. They are to be found in "*The Collected Papers of Joseph Baron Lister.*"

The process of manufacturing strands of catgut does not require description in this paper, excepting to draw attention to the fact that only the outer or peritoneal half of the intestinal tube is utilized in making surgical catgut, the inner or mesenteric half being employed for tennis racquet material, etc. A number of the half tubes of intestines are necessary in making any but No. 000 or the finest strand of catgut, which requires but one strip, or half one intestinal tube. It is said that most of the firms selling or manufacturing catgut in Canada and the U.S. buy the raw material in strands already twisted and numbered. European countries have in the past been the main source of supply. Catgut may be surgically classed in two main varieties, *i.e.* plain and hardened, treatment of the latter being similar to the tanning of leather, various chemicals being employed to bring about this property. While certain solutions used in making plain catgut, or further treatment by chromicizing, may assist in killing bacteria present, they are mainly surface sterilization, as practically all manufacturers of suture material depend upon heat as the ideal method of rendering catgut sterile. It is self-evident that animal tissue cannot be heated sufficiently to kill bacteria and preserve the substance unless all fat and moisture have first been removed. To dissolve out the former, ether is frequently used. Let us analyse this step: catgut is not soluble in ether, and a simple experiment will prove this. Add a little Sudan 3 stain to some pure ether, filter it and place some catgut

strands in the solution. It will be noticed that the catgut does not swell, but remains of the same calibre for some weeks at least. Also on cutting the strands so immersed there is no indication that the stain has penetrated the substance, but it may be found slightly on the surface and between the fibres.

The next step, or dehydration of the material, is of great importance in the manufacture of catgut. When bought in foreign countries it may contain a little moisture when it reaches the manufacturer, and who can say what effect this gradual dehydration may have in rendering the spores of tetanus more resistant to heat than by a rapid dehydration? Hiss & Zinsser[7] quote Ficker "The resistance of bacteria to dessication is influenced by the age of the culture investigated, the rapidity with which the withdrawal of moisture is accomplished, and the temperature at which the process takes place. The spore forms of bacteria are infinitely more resistant to this influence than are the vegetative forms, though they may be destroyed by rapid or complete drying in a dessicator."

Sterilization, then, properly follows dehydration, and is carried out either by heating or, as called by some, boiling in cumol, alcohol, etc. and later tubing it; or tubing it first and then applying the heat, as adopted by manufacturers. Here we must recognize that catgut is not soluble in chemicals such as ether, chloroform, alcohol, toluol, cumol, glycerine or petrolatum, and, as pointed out by one writer, Thos. A. Berryhill[3] "It must never be lost sight of that when heated in a waterfree fluid, the character of sterilization is that of dry heat only, and requires the same degree of heat for effective sterilization as is needed in dry heat sterilization, without a fluid." Dr. Berryhill further states "That preparing catgut by boiling in cumol, is the best method as it not only allows a high degree of heat to be used, but it also deprives the gut of the fats and waxes." It must be admitted, it is true, that a high degree of heat may thus be applied, but it might well be questioned if catgut can be deprived of its fats and waxes by such treatment, since cumol does not penetrate the strands. Catgut sterilized by heat is dry sterilization when heated in any chemical that is not a solvent to the substance. The thermal death-point of tetanus spores must next be considered. For some reason the general impression is that 150° C. is sufficient to kill spores, but so far as the writer can find in searching works on bacteriology, moist heat is always referred to when the above temperature is given. To quote Butterfield & Ely[5] "As far as the writers know, no work has been done to establish the resistance of bacterial life to heat, when the forms of such life are completely dry, under oil, and protected from the effects of live steam." Hiss & Zinsser[7] may be quoted here. "It is thus clear that bacteria exposed to hot air may be considerably dehydrated before the temperature rises sufficiently to cause death by coagulation, complete dehydration necessitating their destruction possibly by actual burning. The same principle as herewith pointed out probably explains the great resistance to heat observed in the case of the highly concentrated protoplasms of spores."

Some manufacturers lay stress upon fractional sterilization in rendering catgut bacteria-free. This method described by Hiss & Zinsser[7] consists in heating the substance to be sterilized to 100° C. for a period of ¼ to ½ an hour on three succeeding days, incubating in the intervals at 37.5° C. to change spores into the vegetative or bacillary forms, bringing about their destruction at a lower temperature. "It is only applicable in cases in which the substance to be sterilized is a favorable medium for bacterial growth, in which it is likely that spores will develop into vegetative forms. Exceptionally, the method may fail even in favorable media, when anaerobic bacteria are present." What are we to say to this method being used when the solutions in which catgut is tubed are neither suitable to the growth of bacteria, or solvent to the substance they are attempting to sterilize? Taking next the reports given out by bacteriologists or laboratories, some of which appear in dozen tube packages of catgut, that samples say No. 0 and No. 2 plain, No. 1 and No. 3 chromic catgut "were incubated 96 hours and found sterile" no difference being mentioned as to the time of incubating the plain or chromic strands, when surgically speaking the latter may be hardened to withstand the body tissues 15, 20 or 30 days. Recent laboratory findings suggest that insofar as catgut and tetanus spores are concerned, un-

less the catgut is first macerated, incubation in vitro is unreliable.

Following the death from tetanus of a patient operated upon by the writer, all available literature bearing upon the subject of post-operative tetanus was read in the hope that some experimental work might substantiate or disprove the idea that catgut was the etiological factor in the causation of this dreaded complication. Bacteriological and pathological findings of reported post-operative cases were singularly inconclusive, and this was so in my own case, although many swabs were taken and tissue excised and subjected to microscopic examination. Unfortunately, no animal inoculation was carried out, although a focus was found similar to tetanus foci described in the literature. Its location was relatively about the upper quarter of the right rectus incision and had as its base the rectus muscle, fat tissue as its walls and coverings. That portion of the No. 2 chromic catgut used to suture the rectus sheath was free in the centre of the necrotic focus, and was sterile so far as examination was carried out. Only part of this loose catgut was removed. The examination did go to prove that the focus described was sterile to any growth of bacteria, proving it was not an abscess, which we also confirmed by its appearance, lack of symptoms, etc. The findings in this case, evidence quoted by others, and my own findings in experimental work, lead me to infer that catgut is most likely the etiological factor in post-operative tetanus and that *the tetanus bacilli may not be liberated from the suture at the time of the patient's death.*

Experimental work.—Situated so far away from any catgut manufacturing plant and the necessity of procuring material to experiment with, led the way to an abattoir, where it was found that sausage-casing manufacture in many respects was similar to the preparation of suture material, and arrangements were made to secure what was required, giving it the added cleaning necessary. The strips of split intestine or its sub-mucous layer, were cut into suitable lengths, inoculated with a bouillon culture of tetanus, twisted into a cord, dried, chromicized, dehydrated, cut into pieces 1 to 2 inches in length. These were put in small bottles, again heated and sterilized, each bottle at a different temperature, except one bottle which was used to test what effect chromicizing would have. Guinea pigs were used as test animals in all cases and control cultures given to the laboratory.

A summary of my experimental work to date goes to prove that the implantation of tetanus-infected catgut into guinea pigs will cause their death with an incubation period similar to that found in post-operative cases and that the laboratory incubation of other pieces of the same catgut will not show any growth in the same time. Also that the necrotic material found surrounding the piece of catgut removed from an animal after a tetanic death will not transmit the disease when injected into another test animal, but the tetanus bacilli may be recovered from the piece of catgut which brought about the death of the test animal. Further experimental work is being carried out.

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QUINIDINE SULPHATE IN AURICULAR FIBRILLATION*

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AS far back as seventy years ago, quinine was recommended in the treatment of heart disease, and was considered especially valuable in patients suffering from palpitation and tachycardia.

In 1914, Wenckebach[1] reported his discovery of the occasional action of quinine in restoring the normal rhythm of the heart in auricular fibrillation. This report appeared to create no further interest until 1918, when Frey[2] investigated the action of the various cinchona derivatives. Frey found that quinidine yielded by far the most striking results in fibrillation and flutter, and that quinidine sulphate, being more readily absorbed, was of more value than the pure alkaloid. About eighteen months ago, Lewis[3] and his co-workers published the results of their investigation regarding the nature of auricular flutter and auricular fibrillation. Briefly, their conclusions were that the onset of fibrillation is due to a circus movement becoming established at some point in the auricle, frequently about the mouth of the superior vena cava, the sinus initiation for the stimulation of auricular contraction of course disappearing at this time. This contracting circle of muscle, in which the new wave travels, persists so long as the abnormal rhythm continues. Lewis points out that in the maintenance of the abnormal rhythm three factors are involved; (1) the length of the central path; (2) the rate at which the wave travels; (3) the duration of the refractory period. These three factors must be in such relation to each other, that the circulating wave of excitation, as it advances, must always find just ahead of it, muscle which has had a sufficient period of rest to restore its excitability following the refractory state, and ready to respond to a stimulus for contraction. Now if in this circus movement any means could be discovered which would close the gap between the wake and advance of the circulating wave, fibrillation could be brought to an end. In other words, prolongation of the refractory period, or sufficient quickening in the rate of conduction in the circle, would terminate the fibrillation, for, when the wave now completes the circle, it will find the muscle still in the refractory period and no response can occur. In a certain proportion of cases of auricular fibrillation, quinidine is a drug which apparently produces this result.

It has been demonstrated that quinidine lengthens the refractory period, but at the same time slows conduction. The first effect would tend to abolish the circus movement. The second would widen the gap between successive waves, and so establish the circus movement more firmly. Thus, in the administration of quinidine, there would appear to be two opposing factors at work, and the result of treatment must depend upon which of these factors gains ascendency.

Since the appearance of Frey's paper in 1918, 461 cases treated with quinidine have been reported in the literature, the greater portion of these within the last year. In fifty-three per cent. of these the normal heart rhythm was restored. This does not mean that in the fifty-three per cent. fibrillation was permanently arrested, for doubtless in the majority, it has only been a temporary cessation.

Other than the case herein reported seven deaths have been recorded in the literature in patients treated with quinidine sulphate[4 5 6 7] In the case of four of these it is possible, even probable, that the administration of quinidine was a factor in producing death, though no certain proof of this has been shown. Five of the six had serious myocardial failure, and a fatal result might not have been unexpected with any method of treatment. Nevertheless, we do know that quinidine can cause alarming symptoms, and we should hesitate to state that it can not cause death. In patients suffering from auricular fibrillation, the majority of whom have some other discoverable cardiac lesion, sudden death is not so very infrequent, and six deaths out of a total of 461 cases under observation, would not be considered a high mortality in a similar number with any or no special treatment.

During the past eight months in the wards of the Toronto General Hospital, thirty-one patients

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suffering from auricular fibrillation have been treated with quinidine sulphate. In all but one patient, the diagnosis of fibrillation has been confirmed by electrocardiogram, and later rhythms have been proven in like manner.

For the present report we have chosen the first twenty-eight cases treated. These form a fairly comprehensive group. The age ranges from twenty-seven to eighty years, the majority being under fifty years of age. The sexes have been almost equally divided.

At the time of commencing the quinidine sulphate, twenty out of the twenty-eight patients showed evidence of passive congestion of the lungs, or liver, or of both. All had limitation of cardiac reserve, the majority to quite a marked degree. A number of the patients treated had formerly been seen in the Out Patient Heart Clinic, and several of these had been under observation while their heart rhythm was normal. In these cases a definite date for the onset of the abnormal rhythm was ascertainable. In the remainder, a fairly certain date of onset could be fixed by the history of the occurrence of more acute symptoms of myocardial failure, *e.g.*, palpitation, increased shortness of breath, oedema, etc. Estimated thus, the duration of fibrillation of the auricles in the twenty-eight cases recorded ranged from three days to six years. All the cases showed some degree of heart muscle change

CHART No. I

No.	Age	W't	Predisposing Cause	Duration of Fibrillation	Estimation of disability before Q.S.	Valvular Lesion	Size of Heart in cm.	Condition of Arteries	Ventricular Rate before Q.S.	Ventricular Rate after Q.S.	Systolic B.P.	Digitalis
1	65	118	art scler.	2 weeks	80%	M.I.	14	++	128	64	150	No
3	49		art. scler.	1 week	50%	M.I.	13.5	+	120	64	120	Yes
4	56	115	art. scler.	3 months	50%	none	14.2	+	140	'84	140	Yes
6	50	135	none	1 year	35%	none	15.6	Normal	100	76	124	No
10	43	140	R.F. & V.D.S.	17 months	60%	M.S.	16	+	72	76	100	Yes
11	80	200	art. scler.	3 days	100%	none	—	+++	140	80	—	Yes
13	36	149	flu—2 yrs.	1 year	75%	none	14.7	Normal	84	64	120	No
16	27	137	tonsillitis flu & V.D.G.	9 months	50%	A.I., M.I. & M.S	13	Normal	60	60	105	No
17	55	123	art. scler.	10 days	75%	M.S.	13.3	+	116	84	118	Yes
18	58	116	none	2 years	75%	M.S.	18	Normal	84	76	122	Yes
19	62	—	R.F. & art. scler.	1 year	75%	M.S.	13.9	++	116	80	118	Yes
20	40	81	R.F., S.F., art. scler.	9 weeks	75%	M.S., M.I. A.S., A.I.	15.1	+	124	80	124	Yes
21	63	168	R.F.	2 weeks	75%	none	14	Normal	74	74	164	Yes
24	37	163	none	2 weeks	40%	M.I.	16.3	+	96	72	108	No
26	49	138	toxic goitre	2 months	90%	M.S.?	14.2	+	136	80	155	Yes
27	43	121	none	3½ months	60%	M.S., M.I.	12.5	+	92	80	120	No

EXPLANATION OF SIGNS AND CONTRACTIONS.—R.F.—rheumatic fever; Art. Scler.—arterial sclerosis; M.I.—mitral insuffias measured in orthodiagram; Q.S.—quinidine sulphate; digitalis—when given within two weeks of commencing Q.S. is indicardiogram.

as evidenced by hypertrophy and failure. The size of the heart as recorded is the greatest transverse diameter measured at right angles to the mid-line. In all but three cases, this was determined orthodiographically, which gives the actual size of the heart. The smallest heart had a diameter of 11 cm. Four of the total number had a diameter of 13.3 cm. or less. The remainder varied from 13.3 cm. to 20.5 cm. in diameter. The normal maximum is about 12.5 cm.

The heart rate recorded before the giving of quinidine sulphate is the rate as found on the day of commencing the drug, and estimated at the apex by auscultation. The rate in the different patients varied from 60 to 140 per minute.

Nineteen of the patients received a preliminary course of digitalis, thereby reducing the heart rate considerably compared with what it had been at the time of admission to the hospital. No rule was followed in the giving of this preliminary course of digitalis, but, when the patient appeared acutely ill, or was in definite distress, concentrated tincture of digitalis was administered for several days, or until the urgent symptoms had subsided. Where a patient is recorded as having received digitalis, it was given within a period of ten days prior to commencing quinidine, *i.e.*, about the total length of time over which digitalis will retain activity in the system after the giving of the drug has been discontinued.

CASES RETURNING TO NORMAL RHYTHM

Quinidine Sulphate	Result	Duration of N.R.	Toxic Symptoms	Changes in ekg. during treatment
1.6 gms. in 2 days	N.R.	6 days	Dizziness, head noises, epigastric discomfort, pain in back	Slowing of auricle
3.2 " " 2 "	N.R.	8 "		
2 " " 3 "	N.R.	6 "		
6.2 " " 11 "	Nil	——	2 months between the 6.2 and 18.9 gms., and 2 days between the 18.9 and 8.4 gms.	Nodal rhythm
18.9 " " 17 "	Nil	——		
8.4 " " 5 "	N.R.	6 days		
3.2 gms. in 5 days	Nil	——	abdominal pain, diarrhoea	Increase in T. 2 and 3
3.2 " " 3 "	N.R.	8 months		
3.6 gms. in 3 days	N.R.	40 days	none	Ventricular extra systoles after 3.2 gms.
3.8 gms. in 4 days	N.R.	9 hours	heart rate increased to 130. Sudden death	Increase in size of auricular contractions
3.2 gms. in 4 days	N.R.	5 months	none	Slowing of auricular rate
1.2 gms. in 1 day	N.R.	5 weeks	none. died of uraemia	none
2.4 gms. in 3 days	N.R.	8 days	H.R. increased to 124	Slowing of auricle
2.9 gms. in 5 days	N.R.	11 weeks	Palpitation and increase in heart rate	none
2.9 gms. in 5 days	N.R.	5 months	Diarrhoea	Slowing of auricle; flutter
0.4 gms in 1 day	N.R.	5 weeks	none	none
2.7 gms. in 6 days	N.R.	5 days	Nausea, epigastric pain; increase in H.R. to 148	Increase in size of auricular contractions
1.8 " " 3 "	N.R.	8 days		
4.8 " " 4 "	N.R.	7 days		
7.2 gms. in 10 days	N.R.	4 days	Nausea; syncopal attack; cerebral anaemia?	Slowing of auricle, ventricular extra systoles
3.2 " " 3 "	N.R.	5 days		
0.2 gms in 1 dose	N.R.	11 days	none	none
0.6 " " 1 day	N.R.	5 days		
0.6 " " 1 "	N.R.	3 months		none
16.9 gms. in 17 days	N.R.	5½ weeks	none	Flutter for one week
1.8 gms. in 3 days	N.R.	24 hours	none	none
1.6 " " 2 "	N.R.	11 weeks		
23.2 gms. in 23 days	N.R.	2 days	Palpitation, Slight epigastric discomfort. H.R. 160	none
1.6 " " 1 day	N.R.	4 "		

ciency; M.S.—mitral stenosis; A.I.—aortic insufficiency; A.S.—aortic stenosis; Size of heart—maximum transverse diameter cated 'yes'; N.R.—normal rhythm; Condition of arteries—+ sign indicates presence and degree of sclerosis; ekg—electro-

The recording of accurate blood pressure readings in auricular fibrillation is uncertain. To simplify the readings, only the systolic pressures have been recorded and the highest point at which any sound came through has been taken. The systolic pressures, thus estimated, ranged from 105 to 240 m.m. of mercury. In five of the patients no valvular defect could be discovered. Of the remainder, ten had mitral stenosis, either alone or accompanied by mitral insufficiency. Five patients had mitral insufficiency only. Seven had a defect of both the mitral and aortic valves. Fourteen patients had definite thickening of the palpable arteries.

In the majority of cases treated, the quinidine sulphate used was that prepared by Mallinckrodt, though for several patients the Howard or Merck product was employed. No variation in the different specimens, either in potency or toxicity, was observed. The drug was in all instances administered by mouth in gelatine capsules. Regarding the dosage and frequency of administration, there was some variation with different patients. On commencing the drug however, a definite rule of procedure was followed. This was to begin with a dose of 0.2 gm. On the following day, two doses of 0.2 gm., with a six hour interval between doses, were given, and on the third day, three doses of 0.2 gm. Following this, if no toxic symptoms had developed the dose was increased. With the earlier cases, a dose of 0.4 gm. was given three times a day. As the maximum effect of the drug is probably of short duration, the more recently treated patients have received smaller doses, given at more frequent intervals. The total dose for any twenty-four hour period never exceeded 1.8 gms.

Of the twenty-eight cases reported in the present series, sixteen ceased fibrillating; *i.e.*, fifty-seven per cent. of the total. Of these sixteen, eight are known to have reverted to fibrillation, leaving eight patients, or twenty-nine per cent. of the total in whom the normal heart rhythm has persisted. The period during which these patients have been under observation has

CHART No. II

No.	Age	W't	Predisposing Cause	Duration of Fibrillation	Estimation of Disability before Q.S.	Valvular Lesion	Size of Heart in cm.	Condition of Arteries	Ventricular Rate before Q.S.	Ventricular Rate after Q.S.	Systolic B.P.	Digitalis
2	43	163	none	2 years	75%	M.S., M.I.	15.5	Normal	80	120	130	Yes
5	49	—	none	3½ months	25%	A.S., A.I., M.S.	15.5	Normal	128	160	120	No
7	44	117	toxic goitre	8 years	50%	M.S.	13	Normal	80	180	120	Yes
8	50	166	R.F., art. sclerosis	15 months	100%	A.I., M.I.	20.5	+++	90	100	240	No
9	52	111	R.F., art. scler.	6 years	60%	M.S.	15.6	++	108	120	120	Yes
12	39	105	R.F.	10 months	50%	M.S., A.I.	17.5	Normal	112	176	130	No
14	66	101	S. throat, art. scler.	14 months	50%	none	11	+++	100	128	220	Yes
15	27	109	R.F., tonsillitis	?	100%	M.S., M.I.	16.5	Normal	106	124	110	Yes
22	50	—	Ex. goitre	3 years	60%	M.I.	16.5	Normal	120	186	150	Yes
23	29	103	none	22 months	60%	M.S., M.I.	13.8	Normal	66	104	126	Yes
25	77	158	none	1 year	90%	M.I.	18.5	+	72	—	140	Yes
28	50	115	R.F.	14 months	75%	M.S.,M.I., A.S., A.I.	14.4	Normal	108	—	128	—

EXPLANATION OF SIGNS AND CONTRACTIONS.—R.F.—rheumatic fever; Art. Scler.—arterial sclerosis; M.I.—mitral insuffias measured in orthodiagram; Q.S.—quinidine sulphate; digitalis—when given within two weeks of commencing Q.S. is indicardiogram.

ranged, with one exception, from five weeks to eight months. This exception is a patient who died about ten hours after the return of normal rhythm. Deducting this patient, we have a total of seven, or twenty-five per cent. in whom the heart rhythm has remained normal for a period of five weeks or longer†

In four of the cases in whom fibrillation ceased but who later relapsed, treatment was repeated, and while a normal rhythm was again obtained (on as many as six different occasions in one patient) yet it persisted only for a few days, and it was it found possible to maintain it in these patients by repeated small doses. In this group the relapse usually occurred between the fourth and seventh day.

From a summary of the cases treated it may be said, that even a careful study of the patient and of his history, fails to give sufficient information to allow of an accurate forecast regarding the ultimate effect of the drug on the cardiac rhythm.

If the cases under consideration be divided into two groups:—one, those responding to treatment, and the other, those in whom no result was obtained, we find that while similar valvular lesions are found in both groups, yet in the group responding to treatment, there is a predominance of those cases in whom there was no valvular defect demonstrated. With regard to the length of time that fibrillation had been established, it appears probable that the cases of long duration may not respond so readily. The cases having a rheumatic or other infective origin, or arteriosclerosis for their possible causation appear about equally divided. The two patients in whom the blood pressure was over 200 failed to respond to treatment. Neither the size of the heart, as measured, nor the heart rate, would appear to have any bearing on the result.

Whether the giving of a preliminary course of digitalis is a factor in the result obtained is uncertain. Digitalis was given to nineteen patients,

†In August, 1922—three months after the reading of this paper—only one patient in this series (No. 26) was known not to be fibrillating. Two others (Nos. 4 and 6), who had been discharged from the hospital with a normal rhythm, we have been unable to trace.

CASES UNINFLUENCED

Quinidine Sulphate	Result	Duration of N.R.	Toxic Symptoms	Changes in ekg. during Treatment
16.8 gms. in 13 days 19.7 " " 18 "	Nil Nil	——	Sweating	none
6.8 gms. in 5 days	Nil	——	Sudden death 3 mths. after q.s.	Increase in auricular contractions
13.2 gms. in 11 days	Nil	——	Palpitation	Flutter, vent. tachycardia
5.6 gms. in 6 days	Nil	——	Dyspnoea, cyanosis	none
10.6 gms. in 9 days	Nil	——	Dizziness	Flutter, slowing of auricular rate
1.8 gms. in 2 days	Nil	——	Cyanosis, palpitation, vomiting, precordial tenderness	Widening of vent. complex, vent. tachycardia
4 gms. in 5 days	Nil	——	Palpitation	Slowing of auricular rate
1 gm. in 2 days	Nil	——	None	Slowing of auricular rate: increase in size of auric. contractions
1.9 gms. in 4 days 0.4 " " 1 day	Nil Nil	——	Palpitation, headache, nausea, diarr., flushing, skin eruption, fulness in chest	none
28.1 gms. in 26 days	Nil	——	Dizziness, fulness in head	none
0.9 gms. in 2 days 1.2 " " 2 " 0.6 " " 2 "	Nil Nil Nil	——	Diarrhoea	none
1 gm. in 2 days 0.4 gms. in 1 day	Nil Nil	——	Palpitation, dizziness, shortness of breath and dazed feeling	none

ciency; M.S.—mitral stenosis; A.I.—aortic insufficiency; A.S.—aortic stenosis; Size of heart—maximum transverse diameter cated 'yes'; N.R.—normal rhythm; Condition of arteries—+ sign indicates presence and degree of sclerosis.; ekg—electro-

and the percentage of cases receiving it in the two groups, responding and not responding to treatment, is about the same. The safer procedure, and one which should be adhered to, is to administer digitalis to all urgent cases at the outset, and later to decide on the advisability of using quinidine.

Turning for a moment to the clinical results obtained from the use of quinidine, the immediate effect of the return of the normal rhythm has been increased comfort to the patient. There has been in all instances either total cessation, or marked diminution of palpitation. Their breathing has been improved, and they were able to lie more comfortably in bed. The general appearance of the patients seemed definitely better with the return of normal rhythm, and their convalescence was apparently shortened.

In the series reported here, and in which may be included all our cases treated to date, one death has occurred. This patient was a man fifty years of age, who had been under observation for one year, during all of which time he had fibrillation of the auricles. There had been no evidence of a valvular lesion, and there was only a moderate degree of myocardial failure. He had, however, definite cardiac hypertrophy. This man received a total dose of 3.8 gms. of quinidine sulphate in five days, which ranges among the smaller total doses given. His rhythm returned to normal on the fifth day, and the heart rate to 80; at the same time his condition appeared excellent. Other than an increase in his ventricular rate during the treatment, he had shown no toxic symptoms. He died very suddenly about ten hours after the return of normal rhythm. He had been feeling very well, had got out of bed without permission and had gone to the bedside of another patient. A few minutes later he returned and was sitting on a chair by his bed when he was seized with a convulsive spasm, fell to the floor, and was dead when a house physician, who was in the ward, reached him. A complete autopsy failed to show the immediate cause of death.

In a number of cases treated, evidences of the effect of the drug, other than the production of normal rhythm, have been observed both clinically and electrocardiographically. Some of these are definitely of a toxic nature, and must be taken as danger signals, and an absolute indication for discontinuing treatment. Of these latter, the earliest to appear as a rule have been diarrhoea, epigastric pain, and nausea with or without vomiting. Other symptoms accompanying those mentioned or coming on a little later, have been palpitation, pre-cordial pain or tenderness, cyanosis, and marked increase in the ventricular rate. An additional ten or twenty ventricular contractions to the minute would not appear in itself to be an indication for discontinuing treatment.

From the results as shown to date in the patients treated, it would appear that the use of quinidine sulphate in the treatment of auricular fibrillation is justifiable. Before this statement is accepted more patients must be treated, and followed for a greater length of time than has been possible in the case of those reported here. While the changes in the condition of those patients in whom the heart rhythm became normal have not been dramatic, yet they would appear to be more striking than those which might have been expected from rest and digitalis alone. It seems probable that quinidine will eventually find a place in the therapy of heart disease. It is to be remembered, however, that it is a potent drug, often acting rapidly and occasionally accompanied by toxic symptoms, which in several instances in our experience have been alarming, and great caution must be exercised in its use. At the present time, the clinical application of quinidine in general practice is perhaps scarcely warranted. It is more safely confined to institutional therapeutics, where patients may be kept under closer observation and electrocardiographic studies made. This is more especially advisable since we have a very useful drug in digitalis, properly administered, for the treatment of auricular fibrillation.

Important precautions in the use of quinidine might be tabulated as follows: (1) Administer a course of digitalis therapy to all cases showing signs of acute failure before commencing the quinidine sulphate. (2) During treatment with quinidine sulphate, and for several days after discontinuing the drug, the patient must be kept absolutely in bed. (3) Commence with a single dose of 0.2 gm. on the first day, two doses of 0.2 gm. on the second day, and three doses of 0.2 gm. on the third day, observing closely for any toxic symptoms. If none appear, then after the third day the dose may be increased to 0.4 gm. three or four times in every twenty-four hour period. This dose should not be exceeded. (4) It would seem advisable that the patient should be seen after every dose or before an additional dose is given. (5) Electrocardiographic observations are of service in diagnosing impor-

tant changes in rhythm, *e.g.*, the onset of flutter or the tendency on the part of the ventricle to assume an abnormally rapid rate, with consequent alarming symptoms of failure.

History and Partial Autopsy Report of Case, No. 6

Case No. 6.—Male; English; Age, 50 years; weight, 135½ lbs.; labourer. Admitted November 17, 1921, complaining of shortness of breath, and occasional precordial pain for the past year. He gave a history of having had gonorrhoea twenty years ago but no other illness.

The patient lies flat in bed with comfort, cyanosis slight, no engorgement of veins, no oedema. There is definite cardiac hypertrophy, the total transverse diameter of heart being 15.6 cm. The heart rate is 100, radial 80, completely irregular. There is no evidence of any valvular lesion. The heart sounds are distant. No evidence of passive congestion. No arterial sclerosis. Systolic blood pressure first at 124. Temperature, normal. Urine, normal; Wassermann, negative.

No digitalis was given. From November 20 to November 24 he was given 3.8 grams of quinidine sulphate, at which time the heart rhythm became normal and the rate was 80. The highest heart rate recorded was 130 on November 21. The largest amount of quinidine given in one day was 1.2 gm.

This patient died suddenly nine hours after the heart rhythm was observed to be normal. He had been examined half an hour previous to death, when he had no complaints, and said he felt well. On that examination nothing abnormal was discovered; no heart murmurs audible. Blood pressure, 118/80. A complete autopsy was performed and the cause of death was not ascertained.

AUTOPSY REPORT (ABSTRACT)

Pericardial Cavity; Contains about 8 c.c. of slightly blood-stained fluid.

Heart: Measures 15 cm. in diameter in the 4th interspace. Weight, 520 grams. The pulmonary artery opened *in situ*, and considerable free blood escaped, but there is no evidence of any embolus or thrombosis. Over the posterior portion of the right ventricle, towards the apex, there is a whitened area about the size of a ten cent piece. On opening the right ventricle this area cuts with much resistance as if it were fibrous tissue. All chambers of the heart are large and apparently in diastole; contain considerable post-mortem blood clot; the least being found in the left ventricle. On mitral and tricuspid valves there is a slight thickening of the edges of the valve curtain; otherwise, valves normal. The left ventricle measures 2 cm.; the right ventricle, 0.4 cm. The four chambers of the heart are somewhat dilated. The heart muscle appears of good quality.

The Aorta measures 5.5 cm. at a distance of 4 cm. above the valve curtains. The coronary arteries are clear and show very little evidence of any atheroma.

Pleural Cavities are free from fluid. There are no adhesions in the left, but several firm fibrous adhesions about the apex of the right lung.

Right and Left Lung.—The vessels and bronchi are clear.

Brain removed. There is some oedema; more on the right side than on the left. The vessels carefully examined are found to be clear. On section nothing abnormal is found.

Microscopic Findings:

Heart.—Considerable pericardial fat. Vessels are engorged and show some sclerosis. There are one or two areas of fibrous tissue with bundles of various sizes scattered through it and also some fat globules. There is much fragmentation of muscle fibres. Thickening of the endocardium with some fatty degeneration of the fibres beneath it.

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THE DIAGNOSTIC VALUE OF THE AGE INCIDENCE OF CERTAIN DISEASES IN CHILDREN*

FREDERICK F. TISDALL, M.D. (Tor.)

A KNOWLEDGE of the age incidence of many diseases in children is of considerable diagnostic value because some diseases are extremely rare before, and occasionally after, certain ages. In the present paper the author has endeavoured to collect scattered data from the records of a large children's hospital bearing on this subject. The age of the patients varied from birth to fourteen years. The following diseases have been considered—endocarditis, rheumatic fever, chorea, scurvy, tetany, intussusception, appendicitis, typhoid fever, pyloric stenosis, pyelitis, diabetes, measles, scarlet fever, diphtheria, mumps, and whooping cough.

Endocarditis, rheumatic fever and chorea have been considered in one group on account of the probability of a common etiological factor in these diseases. The records of 361 cases have been examined. Of these, eighty-two had chorea alone, seventy-four endocarditis alone, and forty-six rheumatic fever alone. Endocarditis and rheumatic fever occurred together in eighty patients; endocarditis and chorea in fifty-seven patients; and endocarditis, rheumatic fever and chorea in fourteen cases. In eight patients rheumatic fever and chorea only, occurred together. From these facts it is evident that the combination of endocarditis and rheumatic fever is encountered more frequently than the combination of endocarditis and chorea, while rheumatic fever and chorea together without endocarditis is comparatively rare. Out of the total of 225 cases which showed some signs of cardiac involvement, only one patient was under four years of age. Out of the 161 cases with evidences of chorea only two were in patients under four years of age, while out of the 148 patients with signs of rheumatic fever three were under four years of age.

From these figures we see that only six cases, or less than two per cent. of a total of 361, were in patients under four years of age. It is therefore evident that endocarditis, rheumatic fever and chorea are of infrequent occurrence before this period. Of these six cases, five were over three years of age. The youngest patient with endocarditis which I have personally seen was one and one-half years of age, although a case has been reported recently which occurred in an infant only three and one-half weeks old. It is obvious that the age incidence of endocarditis in particular, is of great practical value for the differentiation in children of acquired murmurs from those of congenital or functional origin.

Scurvy.—The records of forty-eight cases of scurvy were examined. Thirty-six cases, or seventy-five per cent., occurred in infants from eight to twelve months of age. Only two cases were encountered before eight months of age, one at four months and one at seven months. At the other extreme, only two cases occurred in children over one and one-half years of age. These were two and four years old respectively. The diagnosis of scurvy is relatively simple for those at all familiar with the disease. However, a mistaken diagnosis of rheumatism is frequently made. A study of the age incidence of the two diseases shows that the question of a differential diagnosis need hardly ever be considered.

Tetany.—The age incidence of tetany is of considerable interest in view of its close association with rickets. Schmorl, as the result of an intensive investigation of the latter disease, concluded that microscopic evidences of rickets in the long bones appeared as early as the second month, although clinical evidences of the disease did not appear until the third month. The records of 119 cases of tetany were examined. Two cases occurred at seven weeks, one at eight weeks and one at ten weeks. From four to twelve months of age there were ninety-one cases, or seventy-six per cent. of the total. Only two cases were encountered after the eighteenth month, one at twenty-four months and one at thirty months.

Intussusception.—The records of 100 cases of intussusception were examined. In no disease is the necessity for an early diagnosis and appro-

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priate treatment more imperative in order to avert a fatal result. It most frequently began suddenly with vomiting, colic and screaming. Frequent small stools which consisted largely of blood and mucous, and general prostration followed. A tumour was felt in over seventy-five per cent. of the cases. Of the 100 cases, sixty-five were in infants from four to ten months of age. Only two were under four months of age, one at one and one-half months and the other at two months. Occasional cases were encountered up to eighteen months of age, after which period only about one case occurred at each year. It is seen that the age at which intussusception occurs most frequently is also the period at which infectious diarrhoea is encountered. In both instances there may be vomiting and frequent bloody stools. The onset in intussusception is more abrupt however, and a tumour can usually be palpated. The possible presence of intussusception should always be considered in any infant with vomiting and bloody stools particularly if the patient is between four and ten months of age.

Appendicitis.—The records of 150 cases of appendicitis were examined. This disease most frequently began with pain in the abdomen and nausea and vomiting. Some rigidity and tenderness were always present and were generally localized in the right lower quadrant of the abdomen. In a number of patients a mass was felt. Of the 150 cases only one was under two years of age. This patient was eight months old. Two cases occurred in children in their third year. The age at which the disease was encountered most frequently was between eight and fourteen years of age.

Typhoid Fever.—Until recent years it was thought that typhoid fever did not occur in children under two years of age and occurred but rarely before five years. During the past fifteen years a number of cases of typhoid fever in infants and young children have been reported. The youngest case recorded by Holt and Howland was in a child of eight months of age while Griffiths reported the occurrence of typhoid fever in an infant three months of age. Other cases occurring at an earlier age than these have also been reported. The present series consists of sixty-four cases. The youngest was a male infant five months of age. A positive Widal test and blood culture made the diagnosis unquestionable. The next case occurred at nineteen months. A total of twelve cases were encountered before five years of age. A point of considerable interest is that although only thirty of the sixty-four cases were in male patients, of the twelve under five years of age, ten or nearly eighty-five per cent. were male children.

Pyloric Stenosis.—In view of the probable congenital origin of pyloric stenosis, the time of the initial appearance of the symptoms is of considerable interest. The disease is characterized by sudden, forcible vomiting of a large amount of fluid two or three times a day. This occurs whether the infant is breast or artificially fed. The patient is generally constipated, loses weight and visible peristalsis of the stomach may be seen, particularly after taking fluids. A palpable mass in the region of the pylorus may be felt. The records of sixty-five cases were examined. In fourteen cases the initial symptoms of vomiting first appeared shortly after birth. This is probably a larger number than should be recorded for this period and I have little doubt that if the information in these cases had been obtained with greater care the number would have been considerably smaller. The symptoms first appeared on the second day in one case, on the third day in one case and also on the fifth day in one case. In only three infants did the initial symptoms begin when the patient was from one to two weeks of age. From two to four weeks of age the initial symptoms appeared in thirty-three cases or slightly over fifty per cent. of the total. The latest period at which the symptoms were first observed was seven weeks. It is thus seen that from two to four weeks after birth is the period at which the initial symptoms of the condition most frequently appear.

Pyelitis.—There is probably no disease in infancy which is overlooked with greater frequency than pyelitis. The possible presence of this disease should always be considered in any infant with an unexplained fever. In older children and occasionally in infants other signs may be present, the most frequent being, chills, frequency of micturation, enuresis, vomiting, loss of weight, pain in the renal region and lower part of the abdomen and occasionally blood in the urine. The diagnosis can be made with certainty only by the microscopic examination of the urine. The records of ninety-seven cases were examined. Of these, fifty-four were in infants from three to eighteen months of age while only forty-three in children from eighteen months to twelve years of age. No cases were encountered in infants less than three months old. Of

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the ninety-seven cases, seventy-seven, or eighty per cent., occurred in females. Thus the sex is probably a more important factor than the age in the diagnosis of the disease.

Diabetes.—This disease is not at all common in children. It is much more acute, however, than in the adult and the result is almost invariably fatal. The records of only fourteen cases were obtained. Of these, two occurred under five years of age, one at thirteen months and the other at four years. The blood sugar in the thirteen months old patient was 0.27 per cent. The other cases were about equally distributed at from five to fourteen years of age.

There are a number of diseases other than the ones already discussed in which the age incidence is an important factor in making a diagnosis. As these other diseases are contagious and when diagnosed are usually either treated at home or sent to special isolation hospitals, the records of the cases occurring in the Hospital for Sick Children have not been examined. It is desirable however to mention briefly some of these conditions.

Measles is a disease which is sometimes quite difficult to diagnose especially when the patient is seen for the first time. In infants certain skin conditions may produce a similar appearance of the skin to that which occurs with measles. It is therefore of value to know that measles is rarely encountered before six months of age and is extremely rare before four months. The records of 1,031 cases were obtained from the Toronto Department of Public Health. Of these 1,031 cases only six cases were under six months of age and only one under four months of age.

Scarlet Fever.—The susceptibility of children to scarlet fever increases up to five years of age, after which period it gradually diminishes. The disease is quite rare during the first six months of life and numerous instances have been recorded of nursing infants who did not contract the disease after prolonged exposure to it.

Diphtheria.—Over ninety per cent. of new born infants have a natural immunity to diphtheria. This immunity is gradually lost in a large number of cases by the third or fourth year. The age at which the disease most frequently occurs is from two to six years. It is quite uncommon during the first year of life, and especially during the first six months. However I have personally seen one case which occurred in an infant three weeks old.

Mumps.—The occurrence of mumps in children under two years of age is infrequent.

Whooping Cough may occur at any age during childhood and in contradistinction to other infectious diseases is frequently encountered during the first six months of life. The majority of cases occur under six years of age.

SUMMARY

Endocarditis, rheumatic fever and chorea are rarely encountered in patients under four years of age. Out of 361 patients with these diseases only six were under four years of age and only one under three years.

Scurvy is most frequently encountered in infants from eight to twelve months of age. Only one patient out of a total of forty-eight was under seven months of age. The oldest was four years of age.

Tetany is most frequently encountered at from the fourth to the twelfth month. The youngest patient out of a total of 119 was seven weeks old.

Intussusception.—Sixty-five per cent. of 100 cases occurred in infants four to ten months of age. Only two cases were seen before four months of age, one at one and one-half months and the other at two months.

Appendicitis.—Out of 150 cases only one was under two years of age.

Typhoid Fever.—Out of sixty-five cases only two were under two years of age. One was five months old and the other nineteen months.

Pyloric Stenosis.—The symptoms of pyloric stenosis usually first occur in patients from two to four weeks of age.

Pyelitis.—No cases of pyelitis were seen in patients under three months of age

Diabetes.—Although uncommon may occur at any age during childhood.

Measles, scarlet fever and diphtheria are rarely seen before six months of age.

Mumps is infrequently encountered before two years of age.

Whooping Cough may occur at any age during childhood.

The author desires to acknowledge his thanks to Dr. Alan Brown, Physician-in-Chief and Dr W. E. Gallie, Surgeon-in-Chief for permission to use the records of this hospital.

POST-WAR HEALTH PROGRAMME, HALIFAX, NOVA SCOTIA

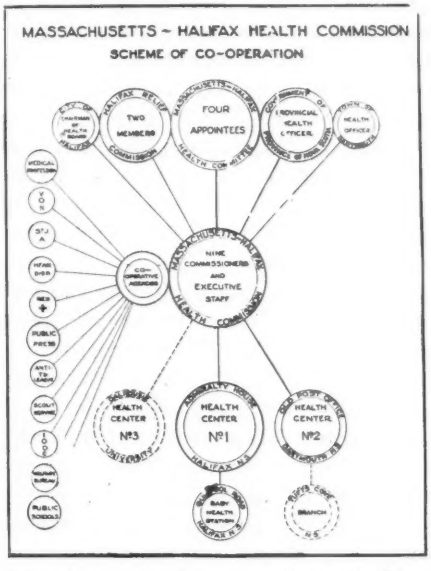
INTERNATIONAL AMITY EXEMPLIFIED

B. Franklin Royer, M.D., D.Sc.

Executive Officer, Massachusetts-Halifax Health Commission and Director of Public Health Nursing, Dalhousie University

THE spirit of co-operation and fraternity during the war was nowhere better shown than in the spontaneous generosity of the State of Massachusetts to the stricken city of Halifax after the explosion there in December, 1917. Besides ship-loads and train-loads of supplies, and a corps of doctors and nurses, a committee of public spirited citizens within a very short time had raised a Relief Fund of $750,000. When the period of emergent relief had passed, there still remained unexpended in the hands of the Boston Committee, approximately $250,000. After a careful survey of Halifax by an expert, Dr. Victor G. Heiser of the International Health Board, it was decided that, because of overcrowded conditions, certain to obtain during the years required for restoration, rebuilding and rehabilitation, a much greater public health effort would be required than formerly, to keep the sick rate and the death rate from rising. It was therefore recommended to the Boston Committee that this money be expended in a Public Health and Preventive Medicine Campaign, to extend over a period of five years. Thus was organized, for the furtherance of this recommendation, in October, 1919, the Massachusetts-Halifax Health Commission, an outstanding example of the international amity between the two great countries of the North American Continent.

It seemed an opportune time to inaugurate in Halifax a campaign for positive health, to apply the old adage, prevention is better than cure: to inculcate in the people an ideal for physical and mental vigor; to build up a desire for, as well as an appreciation of, clean, healthy homes and home surroundings; to create a demand for clean pure water, milk and other foods; in other words, to educate one and all in the newer ideas of nutrition, hygiene and sanitation, thus making possible the closest co-operation and sympathy between the people, the City Health Board and the Commission.



The primary need in carrying out this programme was a corps of efficient public health nurses. The demand for public health nurses elsewhere made it impossible to secure a sufficient number. In order to supply personnel, the Executive Officer of the Commission, in a conference with officials of the Red Cross of the Province, advised that Society to join with the Massachusetts-Halifax Health Commission and the University of Dalhousie in establishing a university course in public health nursing. This was done, and the co-operation of the Provincial Board of Health, the Victorian Order of Nurses, the Welfare Bureau, the school authorities and other local welfare and charitable organizations was also secured. By September, 1920, a class of thirteen graduate nurses, fully trained for all kinds of public

health work was made available for community service—the first public health nurse graduates in Canada. Some of these nurses have been taken over by the Commission, others are employed by the Victorian Order of Nurses, and, through the generosity of the Provincial Red Cross Society, still others are engaged as public health nurses in the various counties. Since 1920, two other classes have graduated, and the fourth class is at present in session, so that the course in Public Health Nursing, so ably sponsored, has become well established.

The work of the Public Health Nurse in the Massachusetts-Halifax Health Commission is wholly instructive and constructive in character. Contact, once established through the clinic or the home, is maintained, and an effort is made to have all health teaching reach every member of the household. Public health nurses ably supported by the visiting housekeepers, seek to inculcate right methods of living and to re-educate and train the family in methods of prevention, chiefly by building up a desire for positive health.

No bedside work is undertaken. The bedside work in Halifax and Dartmouth is done efficiently by the Victorian Order of Nurses. During the time of acute illness, requiring bedside care, the Victorian Order do the only health teaching in the home; at the conclusion of this bedside service, home teaching is resumed by the public health nurses.

At the present time the public health nurse is actually teaching in one family out of every six in the community. In hundreds of instances, her trained eye sees the need of a doctor earlier than would the mother, and her insistence prompts an earlier call, and no doubt often leads to a speedier recovery with perhaps fewer visits than if the doctor had been called in later.

The greater part of the work of the Commission is connected by its several Health Centres. Health Centre No. 1 is held at Old Admiralty House, which, through the Department of Naval Affairs, was placed at the disposal of the Commission, and which is admirably adapted for the purpose. Health Centre No. 2 is situated at the Old Post Office, Dartmouth, for that town, from its proximity on the opposite side of the harbor, suffered considerably in the same disaster. A Baby-Clinic substation is held each summer in another section of Halifax, and in July of this year (1922) a weekly clinic was opened at Tufts Cove in the outskirts of Dartmouth. During the latter part of the summer, a survey was made in Africville, a section of Halifax populated by colored people, and since that date a regular clinic service has been maintained there with good results. To cover these activities, the Commisson has appointed a medical and dental staff, and has engaged one chief nurse, two supervisors, fourteen public health nurses, three visiting housekeepers and two special clinic nurses.

In Health Centre No. 1 there are held the following clinics:—Tuberculosis, now under Drs. Sieniewicz and Grant; Baby Welfare, under Dr. Wiswell; Eye, Ear, Nose and Throat, under Drs. MacLennan & Hemmeon; Psychopathic, under Drs. Kenneth McKenzie and J. G. MacDougall, for taking care of certain of the explosion injured, (this will soon be discontinued); Pre-school age Dental, under Dr. Arrabelle MacKenzie; Nutrition, under Dr. F. W. Tidmarsh; Posture, under Dr. Alan Curry; Pre-school age Welfare, under Dr. Turel. In addition, a Venereal Diseases Clinic, under Dr. Glen Donovan, is held three times a week at the Health Centre, under the Provincial Department of Health in co-operation with the Massachusetts-Halifax Health Commission.

The Tuberculosis Service aims to furnish free medical and nursing advice to all persons unable to pay for it, and to have a public health nurse impress the lessons of right living, feeding, ventilation and the importance of frequent re-examination for the afflicted and exposed. Six clinics are conducted each week. The full-time expert in charge of the tuberculosis clinics is also available free to the city physicians as consultant, and to the city as attendant physician in the Tuberculosis Hospital. During the college year, he delivers a series of lectures on his subject to the medical students of the third, fourth and fifth years at Dalhousie University.

The Baby Welfare service is largely for the guidance of mothers in the pre-natal period, and through the years of infancy and childhood. It is to a certain extent, a well-baby clinic, and yet, from its inception, medical advice has always been given at the clinic to

those mothers who, from necessity, must have it free. At the present time, the total enrollment in this service is about 600. Nurses are considered as of quite as much or more value than doctors in this service, the medical touch being given in great part for the purpose of establishing public health nursing contact with the family and having the nurses in the home establish that environment essential for health-building.

The Commission felt that, in view of the fact that eye strain, diseased tonsils and adenoids have a distinct relationship to preventive medicine, Eye, Ear, Nose and Throat clinics were most essential. The enrollment in these services has reached a total of 541. At certain seasons of the year, operations are performed for the removal of tonsils and adenoids in the necessitous not able to secure admission to the hospitals of the city.

The Psychopathic Clinic was organized for intensive study and supervision of certain of the explosion injured, with sequelae comparable to those following war injuries. A specially trained nurse follows all cases to their homes for the purpose of superintending the medical and suggestive treatment. The number enrolled in this clinic is gradually lessening.

The Pre-School Age Dental Clinic at Health Centre No. 1 has the distinction of being the second of three purely pre-school age dental services on the North American continent. It is coming to be realized that in order to make sure of sound permanent teeth in the adult, right methods of nourishment should be established months prior to the child's birth, and periodical examinations should be conducted during the infant and pre-school age period. This clinic has the warm endorsation of the local dental profession, and has proved a successful innovation—400 children coming four times a year for inspection, advice and treatment. The School dentists have stated that since the inauguration of this clinic, there has been a marked improvement in the teeth of the entering school children.

The Nutrition Clinic is a direct result of the findings of the other clinics. In both Halifax and Dartmouth, weekly classes are held, when the children, in many cases accompanied by the mothers, come to be weighed and measured. The doctors and nurses in charge of these services give interesting popular talks to the children, interspersed with health games and songs which the children enjoy, and at the same time profit by. The individual charts of the children show marked improvement during the year.

This Nutrition service has become rapidly popular, and in order to make it more effective, several visiting housekeepers have been engaged to supplement the work of the Public Health nurses. Besides meeting the children at the clinics, they go into those homes where nutrition problems are paramount, establish friendly relations with the mother and give practical demonstration and advice as to what to buy and how to cook it. In many cases they shop with the mothers, showing them just what meats they should choose for purchase, etc. It is also planned to have Domestic Science Classes at the Health Centre where inexperienced or prospective wives can be trained in the various branches of housekeeping.

The Posture service aims to recognise incipient errors and correct faulty habits, utilizing manipulative procedure and exercises, with hospital routing in the occasional case when necessary.

The Pre-School Age Welfare Clinic developed as an overflow from the Baby Clinic, and to fill a need for food and habit guidance in the growing child who is undernourished.

The Venereal Diseases and Skin Diseases Clinic has an average enrollment of 140. The former, organized under Dominion and Provincial Government support, treats and teaches the afflicted, and serves as a consulting unit in the Health Centre. Patients having positive Wassermann reactions are routed thither for routine treatment.

In order that the various Health Centre Clinics might have the advantage of scientific investigation and check, and that the physicians of the community might be given greater diagnostic laboratory advantages, permission was obtained from the Provincial Government to place a full-time pathologist-bacteriologist with technician in the provincial laboratory. These places were filled in June, 1921, and the scientific services are being appreciated by physi cians and by the public.

The work of the first Health Centre, when reviewed by representatives of the International Health Board of the Rockefeller

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Foundation, influenced them to earmark $200,000 for building a Health Centre on Dalhousie College Campus to perform a similar service for the south end of Halifax. The old Halifax Dispensary, which has been serving the necessitous in Halifax for many years, will merge with the new centre, and perform there its functions as a therapeutic agency.

The function of the Dalhousie Health Centre, which will distinguish it from its predecessors, and in fact, make it quite unique in a wider sense, will be its service as an out-patient department for the group of four hospitals in the immediate vicinity. Here university students will have an opportunity to acquire the right attitude of mind toward community service. They will study the social and domiciliary causes of illness as they study cases. The student's record will be checked against the health workers record for confirmation of observation. In this way, students will have a greater opportunity for practical training in preventive medicine than can be offered at any other point on the American Continent.

Health Centre No. 1 is situated advantageously, and possesses beautiful and extensive grounds, which are being made use of in various ways. The garden space has been divided up into lots which have been taken up by about thirty families living in cramped quarters, and in this way they are able to cultivate a plentiful supply of health-giving vegetables, and acquire a taste and desire for a real home with garden.

During the summer of 1921, part of the grounds were occupied as an open-air camp for mal-nourished children under the supervision of the Anti-Tuberculosis League with most beneficial results.

The graphs accompanying this paper show convincingly the success that has already followed even the partial adoption of modern public health ideas. Infant mortality which was 187.5 per thousand for the ten-year period ending September, 1919, has dropped steadily since that date, and for the year 1921-22 reached 97.5. The general death rate, which was 20.2 per thousand for the ten-year period, has dropped to 14.3 in 1922. Credit for this decrease must be apportioned among all operating agencies, but at least half is due to the newer type of endeavour.

Notable as these reductions are, the rates are still far too high. The death rate among infants ought to be brought well down in the 60's and the general death rate should be brought down to 13 per thousand of population, and possibly, for a period of years, even to 12½. Having seen the reward of their labours after just a few years' effort, all agencies have been stirred to greater endeavour, and we feel sure that the next five years will show a continued decrease in both general and infant mortality.

The demonstration undertaken is intended to be so convincing, that at the close of the Commission's existence, all the various phases of its work will be taken over by the Boards of Health of the City of Halifax and Town of Dartmouth, and will furnish another example of the inestimable value of preventive medicine.

ONTARIO MEDICAL ASSOCIATION

Forty-Third Annual Meeting

WINDSOR

May 29th, 30th, 31st and June 1st, 1923

The profession of the Border Cities who have this meeting in hand and who have been laying and perfecting their plans since June of last year, are now in a position to announce that all is in readiness for one of the best meetings in the history of the Association.

Preliminary Programmes will be issued shortly. Make your plans now to attend. And remember that a right royal good time awaits you.

— PLAN TO BE THERE —

Case Reports

PRIMARY CARCINOMA OF THE PROSTATE, WITH EXTENSIVE GLANDULAR ENLARGEMENT, AND PAIN ALONG COURSE OF SCIATIC NERVE

J. F. Haszard, M.D.

Penticton, B.C.

White male, age 61, rancher, first seen in August, 1922, complaining of pain and tenderness in his right leg. He had always enjoyed robust health with no previous illness. There was a history of an accident in December, 1921, in which he sustained some bruising of the lower back. Physical examination revealed only a few carious teeth and a definite tenderness along the course of the right sciatic nerve. Dental treatment was advised and carried out, with no improvement in the main symptoms.

The patient was seen again in the country on November 15th. At this time he had been in bed for a month. He seemed to have lost weight and strength quite out of proportion to the symptoms and the physical findings. He was admitted to Penticton Hospital, December 5th, complaining of pain in the right leg, slight bladder irritation and a moderate degree of constipation.

Physical examination, on admission; T. 99, P. 110, R.24. Marked loss of weight and strength. No enlargement of the superficial lymph nodes. Pupils equal and active. Knee and ankle jerks present. No Babinski. *Heart* slightly enlarged to the left, otherwise negative. *Chest* somewhat emphysematous, numerous wheezy dry râles throughout. *Abdomen* distended in left lower quadrant, liver and spleen not palpable, no masses palpable. *Per rectum* prostate not enlarged, not fixed, not hard, no nodules palpable, no masses felt in the pelvis. *Right leg.*—Definite tenderness along the course of the sciatic nerve as noted previously. There was no oedema nor swelling. *Urine;* negative on repeated examinations; no frequency, retention or incontinence. While under observation in hospital, the patient suffered greatly from pain in the right leg and latterly in the left hip. On account of a rather obstinate constipation, not altogether relieved by enemata, together with the negative findings on examination of the prostate and urine, a tentative diagnosis was made of carcinoma of the large bowel (probably descending colon) with metastatic pelvic glands. Unfortunately arrangements for a barium enema had to be cancelled as the patient developed a terminal broncho-pneumonia on December 15th and died December 20th.

At autopsy, besides the pneumonic condition of both lungs and a chronic adhesive pericarditis, there was found a small primary focus in the prostate (less than 1 cm. in diameter) which proved to be adeno-carcinoma on laboratory examination. There was no appreciable enlargement of the gland, although it was slightly firmer than the normal. The bladder and urethra were not involved. There were, however, massively enlarged pelvic glands on both sides, with direct extension to the retroperitoneal glands up to a point two inches below the diaphragm. Many of these measured 5 and 6 cm. in length. In spite of the pelvic growths the wall on the left side was quite smooth and to this may be attributable the failure to discover them on rectal examination.

A few mediastinal glands showed early metastatic growths and there were also a few scattered areas of carcinomatous growth about 1 cm. in diameter, throughout both lungs. The gastro-intestinal tract was negative, except that a portion of the descending colon for a distance of six inches above the sigmoid was dilated and of paper thinness. No obstruction could be found to account for this. All other organs were negative on careful inspection.

The features of this case which made diagnosis difficult were:

(1) The unusually small primary growth, with no encroachment on adjacent structures.

(2) The smoothness of the pelvic wall, notwithstanding the very great enlargement of the pelvic glands. The masses higher up were masked by the abdominal distention, which rendered palpation difficult.

(3) The cachexia and grade of anaemia present were relatively slight in proportion to the size and extent of the secondary growths.

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Editorial

ON RUPTURE OF INTESTINE

ATTENTION is directed to a paper on "Rupture of the Intestine," published in this issue of the *Journal*. The subject is covered at length and this may discourage some of our readers who may at first glance consider that it is for the perusal of surgeons alone. Not so. In this, more than in many surgical conditions, early diagnosis is the all important factor in the prognosis, and inasmuch as the accident more commonly effects active and vigorous young adult males, its early recognition and prompt treatment have a definite economic value of national importance in a country such as ours. The physician who first sees the patient must appreciate the variety of the violence which may produce rupture of the intestine; must recognize the early signs or suspicions of the condition; and must assume with the courage of his convictions the responsibility of radical treatment. Unoperated cases have a mortality of 100%, whilst delayed operation is almost as bad. To "wait and see" spells death. A.T.B.

THE MENACE OF TYPHOID

THE remark attributed to the late King Edward VII. in reference to tuberculosis, "If preventable why not prevented," is very apropos in regard to typhoid fever in this day and time. The statement in this issue of the Chief Medical Officer of health for Ontario in reference to the epidemic of typhoid fever at Cochrane, makes a story to give pause to the optimist who thinks that everything possible has been done to eliminate this scourge. When we compare a mortality for the Province of Ontario of 37.8 per 100,000 in 1906 with one of 7.2 in 1921, it points to a remarkable achievement and it is a still greater achievement that the cities of Ontario had a death rate of 51.3 in 1910 and of only 4.3 in 1922.

It may be noted that for the large cities of the United States, the combined death rate was 19.59 per 100,000 in 1910 and 3.15 in 1922. The three great causes for the improvement in these figures may be set down as better water supply, better milk supply and more efficient sewerage, and in these directions the city has a great advantage over the small town and the country village, but no effort toward the improvement of the death rate as a whole can succeed until the country village and the small town have water supplies which are placed beyond the reach of suspicion. Familiarity breeds contempt and a potential danger to a water supply may be overlooked or ignored until the expected happens.

The recent epidemic at Mansonville, Quebec, is a case in point. According to the information furnished us, a water supply for years regarded as ideal, was contaminated during the spring thaw from a case of typhoid in a house from which sewage flowed into a brook which fed the reservoir. Is this not a good time to examine the locks on many other stable doors throughout Canada.

before other valuable horses are stolen? It is not too much for medical men everywhere to demand that not only shall the water and milk of their districts be uncontaminated, but what is more difficult but equally imperative that they shall be "every day and in every way" beyond the risk of accidental contamination.

The water supply into which any sewage *can* come is one into which on some day typhoid *will* come, and if a "certified" water cannot be attained, efficient chlorination would seem indispensable. To popularize anti-typhoid inoculation should be our duty particularly for everyone in an infected area, and also for those who plan vacations in the country where they run the added risks of newcomers in a possibly infected locality. A. H. G.

AN EMPIRE-WIDE MEDICAL SOCIETY

ONE of the results of the great war seems to have been a quickening of the more or less latent regard which the Mother Country, and each of the self-governing Dominions have always entertained for each other in respect of their medical professions. In Canada, and particularly in Ontario, then Upper Canada, the legislative and other standards of the profession were well and truly laid in the early days by men who, with but few exceptions, came from the great schools of London, Edinburgh and Dublin. Many of them came first to Canada as medical officers of the Navy or the Army. Legislation upon medical matters, both in the older provinces as Nova Scotia, and in those more lately organized, as in the west, followed naturally the same precedent. The same influences were doubtless at work in the early organization of the profession in Australia, New Zealand, and South Africa, while in the smaller outposts of Empire, such as the West Indies, Singapore, Hong Kong, British Guiana, the connection of the local medical profession with that of the Mother Land has been even more direct and intimate.

The great war did more perhaps than has been recognized yet to establish between the medical services of the mother land and the outlying Dominions that foundation of acquaintanceship and mutual respect upon which, if once it be laid, there tends to rise automatically a comely superstructure of active fraternity and goodwill. So that we are not surprised to find that within the last year or two the parent society, the British Medical Association, has arranged a greatly extended and more close relationship with the profession in New Zealand, Australia, and South Africa, as well as in the smaller British communities dotted all about the Seven Seas.

It would seem that if this *rapprochement* is desirable in the other Dominions it is at least equally so in Canada, and this would seem to be the opinion of the profession here, if we can judge by the replies received to a questionnaire recently sent out to the profession at large by the Associate-Secretary of our Association. One of the points in the questionnaire was whether an invitation should be sent to the British Medical Association to meet again in Canada, perhaps in 1926. Of 1328 replies received, 28 said no, 1227 said yes, and 73 did not answer this particular question. This result should be fairly conclusive as to the position likely to be taken if the question comes up, as is expected, at the Montreal Meeting of the C.M.A. in June next.

There is also the larger and more important question of some form of affiliation between the Canadian and the

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British Medical Associations. The sentimental reasons for such a liaison lie upon the surface, and like the bonds of Empire may be found to be all the stronger because sentimental. No close and binding arrangement involving much additional financial responsibility or any impairment of local autonomy could be desired by either body. But an official connection with the British Association and through it with the professions of the other Dominions has in it a great appeal to the imagination, and if the Executive of the Canadian Medical Association should see fit to request the attendance at the Montreal meeting this year of two or three accredited representatives of the British Medical Association, the request would meet with an immediate and cordial response from the latter body, and a discussion would be initiated which could hardly fail to bring about desirable results.

J. T. F.

INDUSTRIAL MEDICINE IN RELATION TO PUBLIC HEALTH

THE development of the industrial system of to-day from the trade guilds of the middle ages has transformed the whole life of civilized nations, and industrial medicine which deals with the well-being, safety and human rights of the vast majority of the population has become one of the most important branches of public health.

The problems of industrial medicine come under three general headings: (1) the prevention and control of communicable diseases; (2) the correction of unhygienic conditions of life and work which determine or contribute to premature death; (3) the prevention of occupational diseases and industrial hazards.

It is only in recent years that we have begun to understand and appreciate the underlying principles of the conditions affecting the health of industrial workers, such as ventilation, hours of work, fatigue, light, cleanliness, temperature, humidity, etc., etc., and of the many factors that determine the condition of health and longevity of man, perhaps none is so important as his daily occupation. In some instances, the conditions which make an industry hazardous originate from the employer's negligence or ignorance; in others it is in the nature of the industry itself; finally the industrial worker suffers many avoidable accidents and preventable diseases through indifference, carelessness, or lack of knowledge. For both employers and employees the most vital problems of to-day are in connection with those matters concerned with the health of industrial workers.

B. L. W.

THE IMPROVEMENT OF PROVINCIAL RELATIONS IN THE PROFESSION

THE spirit of the present day in all activities, professional, commercial, industrial, educational or other, is that of "getting together." Individualistic effort in large affairs or projects is passing and being rapidly supplanted by more communalistic endeavour. The war has emphasized by demonstration the result of mass thought and action, and we see many other illustrations of this in our daily lives.

In order that the maximum results and greatest benefits might ensue to all

the profession of Canada, the Canadian Medical Association has for many years felt the need of closer relations with the various provincial associations or organized units of the medical profession in Canada. To this end a Committee on Provincial Relations has been appointed who will report, if possible, to the meeting in Montreal in June next. The Committee appointed is thoroughly representative, the personnel being as follows:—

Dr. J. S. MacEachern, 200 MacLean Block, Calgary, Alta.
Dr. R. G. Ferguson, Fort Qu'Appelle, Sask.
Dr. D. A. Stewart, Ninette, Manitoba.
Dr. E. R. Secord,112 Market Street, Brantford, Ont.
Dr. A. T. Bazin, 583 Dorchester St. W., Montreal, Que.
Dr. W. F. Roberts, St. John, N.B.
Dr. S. L. Walker, Halifax, N. S.
Dr. A. MacNeill, Summerside, P. E. I.
Dr. Simeon F. Grondin, Quebec, Que.
Dr. M. T. MacEachern, 426 Jackson Building, Ottawa, Can.

The purposes of this Committee are well defined in the following clauses:—

(a) To devise ways and means of bringing all Provincial Medical Associations into closer relationship with the Canadian Medical Association; making the Provincial Associations more helpful to the Canadian Medical Association and *vice versa*.

(b) To assist the Executive of the Canadian Medical Association in matters of adjustment between any of the Provincial Associations and the Canadian Medical Association.

(c) To develop and foster a deeper interest of each Provincial Association in the Canadian Medical Association with the ultimate desire of building up a strong national organization of medicine.

Already the Committee finds numerous ways and means by which these objectives as laid down may be accomplished, resulting in the National Association being of greater service to all the profession of Canada.

If the advancement of the practice of medicine in Canada to-day is to keep pace with Canadian development along other lines, there must be complete and thorough organization functioning to the advantage of all along clearly defined lines, active in its proceedings and rich in its accomplishments for the general good of the profession. With such organization, definite, clear cut and keen, comes better relations and more harmonious working contacts. The Committee has already been impressed with the fact that there exists a considerable degree of healthy interdependence among the numerous organized units, whether provincial or national, and further, they are convinced that there must be established better avenues for interchange, intercommunication and interaction. There is urgent need of coming together in a more co-ordinated and co-operating manner so as to consult more on the various problems and to help each other generally. Mass thought and action is needed in the profession, for the practice of medicine cannot remain local or provincial in nature; the national aspect must always be remembered. Our splendid medical profession of Canada can no more accomplish their best and serve in the highest degree our grand and wonderful country if they continue as isolated individual members or organized units acting along their own specific lines, than could the great army in the recent war had they fought in separate battalions each pursuing its own way without regard for the other. Interdependence, intercommunication, interchange and interaction were a necessity; our army composed as it was of battalions from every province, to obtain its victories had to close up shoulder to shoulder and act as one corps with a brave front to the enemy. Likewise, our medical organizations or units must line up together if we want to be a strong profession, as our traditions demand that we should be.

Needless to say, it is the desire of every medical man in Canada to have a complete national organization, truly representative in nature with well defined functions and a clearly established basis of relations, internally and exter-

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nally. This organization should embrace all local, district and provincial societies and should be developed along these three lines —

Firstly—The establishment in every province of local or district units or associations, to deal with matters of local concern, scientific advancement, etc.

Secondly—Provincial associations, to deal with matters of provincial or more general scope, and to act as a co-ordinating force amongst the various local units within the boundaries of the province. While some of the provinces are well organized, in others there is still considerable organization to be effected.

Thirdly—The national association, to deal with matters of national concern, to act as a co-ordinating means amongst the various provincial units and to assist organized units of the profession throughout Canada in any of the provinces. The national association should be in a position to serve in any capacity called upon.

The Committee is sure that all this can be accomplished if the support of the profession of Canada is forthcoming. Through such organization, with a field secretary and national headquarters, the service referred to can be rendered. It is expected that a very interesting report will be submitted.

M. T. M.

Prevention of Peritoneal Contamination in Drainage of Abdominal Abscesses.—Two methods of safe drainage of deep seated intra-abdominal abscesses are presented by Joseph Rilus Eastman, Indianapolis. One plan is that of approaching a laterocolic or retrocolic abscess by an entirely extraperitoneal route; that is, the incision is made lateral to the classical appendix incision, and extends only to the peritoneum. The parietal peritoneum is then peeled away from the musculature of the flank, and the abscess opened bluntly at the bottom of the extraperitoneal canal thus formed. The plan is described as follows: About fifteen years ago, in attempting to reach a retrocecal abscess as described above, it was found easily possible to peel off the peritoneum down to a position alongside the cecum; but the exploring finger found no ulcerated area through which a puncture could be made without danger of admitting virulent pus into the free peritoneal cavity. Therefore, the space alongside the cecum was loosely packed with two strands of gauze, between which a large rubber drainage tube was passed, the ends of the gauze and the drainage tube protruding at the wound in the flank. About eight hours after the operation, the abscess broke spontaneously, and a large amount of pus was discharged from the wound. The gauze was removed gradually, and the tube was taken out after ten days. There were no subsequent signs or symptoms of abscess, nor has there been any recurrence of appendicitis symptoms nor any intra-abdominal trouble of any kind in the years that have lapsed since the operation. Eastman says he has often dealt in this manner with abscesses consequent to appendicitis, and he has been surprised to note how completely this plan of utilizing suction and chemotaxis has removed every vestige of infection in and about the appendix, and how free patients thus operated on have remained, from any postoperative complications.—*Jour. Am. Med. Assoc.*, March 24, 1923.

Eggs as A Source of Vitamin B.—By extraction of egg yolk with water, Thomas B. Osborne and Lafayette B. Mendel, New Haven, Conn., secured a product comparatively rich in vitamin B, the daily dose required for a 100-gram rat being considerably less than that of the most potent dried yeast hitherto examined. The content of the egg yolk in vitamin B is not large, a daily intake of at least 1.5 gm. of the fresh yolk being required when it furnishes the sole source of vitamin B to a 100-gram rat. The whole egg is accordingly not exceptionally rich in vitamin B, when contrasted with other foods already investigated. Judged by the comparative trials on rats, the average sized hen's egg is equivalent in vitamin B potency to about 150 c.c. of cow's milk, or a quart of milk and six or seven whole eggs of the average sort have an approximately equivalent vitamin B value.—Jour. Am. Med. Assoc., February 3rd, 1923.

Editorial Comment

METHANOL, THE NEW NAME FOR WOOD ALCOHOL

Wood alcohol, methyl alcohol and methyl hydroxide are the names by which the spirit obtained by distillation of hard woods has been known. For many years these spirits have been known to the profession as a dangerous poison, a menace to eyesight, and in larger amounts to life. Great numbers of the working class, however, are not acquainted with its toxic properties and as under the term of wood alcohol it is in common use in the arts, it is felt that the name itself may be suggestive, and may induce thirsty workmen to attempt the use of it as a beverage. Ignorant manufacturers also, because of its low price, have made use of it in preparations for internal use. Many casualties arising from its employment in this way have been reported from time to time. In 1892, at the International Conference on Chemical Nomenclature held in Geneva it was decided to discard the name alcohol as applied to it and use in its place the chemical term *methanol*. This name for these spirits was promptly adopted by many of the European nations and was also strongly advocated in the United States by the late Dr. Baskerville. The National Wood Chemical Association of the United States has recently issued a small pamphlet on the subject urging, on the plea of public safety, that the name of wood alcohol be discarded and the word methanol used in its stead. All Canadian physicians will, we are sure, favour this change of name. A.M.

ST. MICHAEL'S HOSPITAL MEDICAL BULLETIN

The second number of this very excellent clinical journal has been received. It is edited by members of the staff, and is an excellent record of the work carried on in the wards and laboratories of a very up-to-date hospital. All the departments are well represented. The group of papers presented in this number are interesting, well written, and will well repay the reader. It is not, however, to the contents that we desire to call special attention in these remarks, but to the fact that the writing and editing of the journal is the work of the Hospital Clinical Society and we commend its objects as stated in an introductory page, to the staff of every hospital in Canada. Weekly meetings are held, with one of the staff as presiding officer, at which interesting clinical cases and specimens from the several wards are shown, so that each interne obtains a comprehensive view of the work being done in the hospital. Cases and specimens are selected for presentation at meetings of other societies, articles are chosen for publication in the jour nal, and junior members are encouraged and their efforts criticized by the seniors. All the work is encouraged and more or less supervised by the visiting staff, but the members of the house staff are credited with their part in the reporting of the case. Case reporting for journals should be an integral part of a senior interne's training, and when efficiently supervised reflects credit not only on the interne himself, but also on a hospital in which work of a high character is carried on. The publications of many of our important writers in medicine are evidence that the foundation of their success was laid when they were house officers or even senior students, and their early writings were suggested and encouraged by a kindly disposed clinical chief. In the writer's opinion these reports by the interne staff of St. Michael's Hospital represent progress along these lines initiated and stimulated by encouragement from the attending staff.

Of the several objects of St. Michael's Hospital Clinical Society as stated above we desire in closing to emphasize the value of the last one, which reads to encourage junior members to give demonstrations and write articles so that they may gain confidence and experience from the criticism of their friends. This object, if attained, will mean much in the education of young physicians.

The editors of this number are to be complimented on its contents, and on the new spirit which it represents. The staff of St. Michael's Hospital and its Board of Governors are also to be complimented; they have placed before us an excellent example of combined work, which we hope other Canadian hospitals will follow. N.B.G.

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Correspondence

A COMMUNICATION FROM THE BRITISH MEDICAL ASSOCIATION

To the Editor.—As I have previously explained to correspondents in Canada it has always been a great source of pride to the British Medical Association that it includes large numbers of the medical profession all over the British Empire, and it has been with great regret that during the past few years we have seen the gradual relaxation of the connection between the Canadian medical profession and the British medical profession, as represented by our Association. We have felt this all the more keenly because we have grown much stronger in other parts of the world, particularly in Australia and New Zealand, and Canada is the only Dominion in which we have held an Annual Meeting. We remember with gratitude the very successful Meetings in 1897 and 1906.

Further, we remember the way in which our Canadian colleagues took their share of the burden during the war and we wonder whether it is really inevitable that the bond between the Canadian medical profession and ourselves shall become less close and finally disappear. We profoundly hope not, and for that reason we have earnestly asked the Canadian Medical Association if steps could not be taken which would provide in some way for a bond between us which, if mainly sentimental, need be none the less useful.

When you ask me to name the terms on which any such affiliation could be brought about, I find myself in difficulties. We have never hampered our Dominion branches as to the way in which they choose to conduct their own affairs and we realize that they need journals of their own to deal with their own doings. But we have always regarded our name—the British Medical Association—and our *Journal* as the great bond between ourselves and our members in the Dominions. Anything else we can offer must necessarily be of a less substantial kind. It occurs to me, however, that the two Associations could arrange for the mutual supply of helpful information, for action in support of one another where professional interests are threatened by lay bodies, for the right of members of each body to take part in the annual or other meetings of the other when they are travelling, and for an occasional meeting of the two bodies in Canada —or in England, why not? We are often able to help our branches in Australia, New Zealand, South Africa and elsewhere by warning members of the profession from taking appointments to which the Association in those parts of the world takes strong objection. You no doubt occasionally have your difficulties with lay bodies who are proposing to employ medical men; you will certainly find these increase as your population increases. Attempts may probably be made to introduce medical men from this country to fill posts which your own men will not accept, and I think you would find we could be very useful to you on that.

Other suggestions will I am sure present themselves: I merely throw these ideas out for you to think over. But I am convinced that we can get no further in this discussion until some of us who believe that there should be a closer bond of union between the profession in Canada and the rest of the British medical profession, get round a table with a view of finding out how it can best be done. In suggesting this I am assuming, of course, the desire on both sides to find a way. I can assure you the desire on this side is very strong.

Dr. J. W. Scane, the Secretary of your Association, of whose illness we are extremely sorry to hear, has told me that owing to the preoccupation of the Canadian Medical Association at its annual meeting at Winnipeg, in 1922, with pressing local business, it was not possible to give serious consideration to this question. We have suggested that possibly the best plan would be for a representative or representatives of this Association to come to Canada and confer with representatives of your Association. The time is getting very short for any arrangement of this kind in connection with your meeting in June, so I would like to suggest that any representatives of your Association who propose to be in England at the time of our annual meeting at Portsmouth, in July next, should be authorized to meet some of our representatives here, talk the matter over and report. Such representatives would be made very welcome.

I am afraid the suggestion of the Executive Committee of the Canadian Medical Association that we should appoint Sir Berkeley Moynihan,

Sir Robert Jones, or Sir William Taylor, who are expected at your annual meeting, as an emissary from our Association to discuss the question with your Council, is impracticable. Such a discussion could only take place with advantage between people who are thoroughly conversant with all the constitutional points that may arise, and no one of the gentlemen mentioned has an intimate enough acquaintance with the internal working of our Association to deal effectively with the matter, though I am sure that any of them would be delighted to do anything to draw closer the bonds between the British medical profession in the rest of the Empire and the British medical profession in Canada.

I sincerely hope that now the question has been raised it will be thrashed out with a sincere desire on both sides to arrive at some arrangement which will be beneficial to all of us.

ALFRED COX, *Medical Secretary,*
March 29th, 1923 *British Medical Association*

Harvey as an Art Critic.—An interesting paper on Dr. William Harvey as a man and an art connoisseur was read by Sir D'Arcy Power at the Paris Congress of the History of Medicine in 1921, and has now been published in its *Transactions.* For the most part Harvey's biographers have concentrated upon his scientific attainments, and few have thought of him as a man of like parts and passions as ourselves. Sir D'Arcy Power deals with his human side—with his hobbies and his earlier years. The early Stuart period was marked by a renaissance of art in England. Even in the later years of Elizabeth's reign, art collectors existed, chief among them being the Lord Lumley, founder of the Lumleian lectures at which Harvey was destined to announce his discovery of the circulation of the blood. The fashion spread rapidly under James I. Within ten years of his accession, the Earl of Arundel, the Earl of Essex, the Duke of Buckingham, and Lord Pembroke were buying art treasures in Italy, in Spain, and in the Levant; were commissioning artists like Rubens and Van Dyck; and were employing such agents as Inigo Jones and the Rev. William Petty to advise and help them. Whilst Inigo Jones was studying painting and architecture in Italy at the expense of Lord Pembroke, Harvey was studying medicine at Padua, where he graduated in 1602. Later in life they certainly were acquainted, for in 1655, three years after the death of Jones, John Webb published *Stonehenge Restored* at the instigation of Harvey and Seldon, a work which Jones had left unfinished. Apparently Harvey's residence in Italy had engendered in him a love of the arts, especially painting. The number of portraits for which he sat suggested that he was an unusually good sitter, who was thrown much into the company of artists. In 1636, Harvey travelled in the suite of the Earl of Arundel when that nobleman was sent as Ambassador Extraordinary to the Emperor Ferdinand II. In the course of this tour Harvey was given "a little start" into Italy with "some employment to Mr. Petty about some pictures for His Majesty." The Rev. William Petty was one of Lord Arundel's agents and art collectors, and it is to his artistic acumen that we are mainly indebted for the Arundel marbles. Harvey's journey from Ratisbon to Venice was not without adventure. On the pretence of an irregularity in his passport he was detained at Treviso, whence he wrote angry letters of complaint to Lord Fielding. Lord Arundel heard of his difficulties and wrote to Mr. Petty: "I hope poor Dr. Harvey is with you by this. I received a letter from him yesterday that he has been miserably vexed in the lazaretto at Treviso. I hope he will recover his time lost with satisfying his curiosity, which you will assist him in at Florence and Rome." Of Harvey's energy the Earl speaks jestingly in another letter to Petty: "I hope I shall see the little perpetual movement called Dr. Harvey here before my going." These letters show that Harvey was held in high estimation for his personal qualities, and that so great a judge of men and art as the Earl of Arundel thought him worthy to be entrusted with a commission to buy art treasures at Rome for the King. It is true that the Earl considered Harvey only as an amateur and entrusted him to the care of Petty, who was a professional in the art of collecting. But the correspondence bears out what we knew from other sources—that Harvey in his prime was a genial and lovable little man with artistic taste that ran in the direction of pictures. It is perhaps not without importance to reflect that other great scientific discoverers, notably John Hunter, Jenner, Sir Charles Bell, Charcot, and Pasteur were, like Harvey, men of uncommon artistic tastes. —*Brit. Med. Jour.*, April 14, 1923.

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Abstracts from Current Literature

MEDICINE

Blood Destruction During Exercise. Brown, G. O.: *Jour. of Exp. Medicine.*, Nov., 1922, Jan. and Feb., 1923.

In a series of articles the writer reports his observations on the changes in the blood caused by exercise. He experimented with dogs and found that prolonged exercise caused an increase in plasma volume and a drop in cell volume and pigment percentage. There was also an increase in the number of reticulated cells in the blood, thus pointing to bone marrow activity. This increase was at first marked, was followed by a drop in number and then by a steady gradual rise. These phenomena are explained by the theory that the marrow has a certain number of cells held ready for an extra demand, and that these are sent at once into the circulation whereupon the marrow turns out cells in increasing number till the cell volume percentage is restored to normal.

If the animal was transfused after exercise the number of reticulated cells was not increased, the destroyed cells being replaced by the donor's cells and the marrow spared. When the animal was made plethoric by transfusion before exercise there was no increase in the reticulated cells. Exercise seemed to be a definite stimulus to the haemopoetic system. The cause of the increased cell destruction during excercise was not determined, but was thought to be mechanical and due to the quickened circulation.

Dogs that had been kept caged for a long time showed a very marked drop in cell volume and pigment percentage after a period of exercise, but these same animals, when exercised daily, soon showed the normal cell volume and pigment percentage again, showing that a period of training, estimated at about 3 weeks, developed an equilibrium between blood destruction and regeneration.

Autopsies were performed and the dogs that had been exercised were found to have larger spleens and more red marrow in the long bones than in control dogs which had not been exercised.

These experiments show that in sedentary individuals the bone marrow can become sluggish and atrophic, and when unusual exertion is undertaken, it cannot meet requirements, *i.e.* it is in a state of decompensation. By a brief period of training, however, the bone marrow can be so developed that it can cope with greatly increased demands. R. H. M. HARDISTY

Treatment of Diabetic Gangrene. Root, H F.: *The Boston Med. and Surg. Jour.*, Dec. 14th, 1922.

The author cites seven cases treated successfully by operation. He lays stress upon the importance of the *prevention* of gangrene in diabetes, with systematic exercise duly accompanied by massage, and periods of rest. He draws special attention to the presence of minor lesions of a surgical nature, which should be very carefully treated to avoid disease. In this connection, the proper care of the nails and of corns, and the avoidance of cutting them, is emphasized; also the treatment of any infection. It is of the greatest importance to secure proper circulation by elevation of the foot.

When gangrene with infection has arrived, the author recommends prompt amputation so soon as other treatments show no sign of improvement. According to his views, the operation is preferable even when sugar is present, and even with acidosis. Immediately after operation, he suggest a liberal supply of carbohydrates, even as high as 100 grams daily, in the form of oatmeal gruel with skimmed milk, shredded wheat and albumen.

He prefers spinal anaesthesia, but if ether is required, the operation should be as brief as possible. C. F. MARTIN

The Standard of Cure in Syphilis. Fraser, A. R.: *Amer. Jour. of Syphilis*, Oct., 1922.

The author discusses the Wassermann readings and holds to their value in diagnosis, though he considers them unreliable as a guide to the treatment. A slow and progressive sterilization is emphasized in order that the drugs used should stimulate the defensive activity in the tissues, as well as acting as parasiticides.

The treatment should be continued for two or three years irrespective of any Wassermann reading. The author further stresses the importance of treating each patient as an individual, and he regards periodical clinical investigation as a necessity during the rest of the patient's life.

An adequately treated syphilitic may be permitted to marry at once, but the wife of such a syphilitic should be subjected to intensive treatment throughout the period of each succeeding pregnancy. The child, too, he considers should be treated from birth for a period of three years, whether signs of disease are present or not. The Wassermann test in the new-born is unreliable. C. F. MARTIN

Practical Diagnosis of Heart Insufficiency. Grassmann, K.: *Munch. med. Woch.*, Aug., 1922.

The author's observations lead him to emphasize the importance of examining the sufficiency of the heart as a whole. Does it respond to the demands of occupation and of general regime? According to the occupation of the individual, so must the treatment necessarily be controlled.

He regards the diagnosis of heart insufficiency in the early stages as a difficult problem. Any one syndrome alone cannot be regarded as positive evidence of insufficiency, and he agrees with Mackenzie's view that the first symptom of insufficiency is always a subjective one. The physical examination may be entirely negative, even in the presence of dilatation, murmurs, etc., and under such conditions it is extremely difficult to differentiate between neurosis of the heart and insufficiency of its muscle.

The methods of Mosler and Schrumpf are commended. Mosler estimates to some extent the degree of insufficiency by taking the blood pressure during quiet respiration and then during a 25 seconds halt of inspiration. When no changes occur, it means that the heart is either healthy or compensation is good. If, on the other hand, the blood pressure rises, the heart is probably hypertrophied but still compensating well. If, however, the pressure falls, insufficiency is on its way. Schrumpf observes frequency of the pulse and the blood pressure in the change from the recumbent to the standing position.

Nevertheless, all these methods are of minor importance in comparison with the history of the case, the adaptability of the patient to his occupation and to various forms of exercise.

C. F. MARTIN

Benign Albuminuria in the Case of School Children. Lauener, P.: *Schweiz. med. Woch.*, Dec., 1922.

The term "benign albuminuria" is intended to include all forms unassociated with renal disease, but it is not always easy to distinguish the harmless forms and those due to renal or cardiac disease and infections. The juvenile or orthotic forms probably belong to the group of benign albuminurias without renal lesion. The condition appears at irregular intervals, and the amount of albumin may sometimes be considerable.

The author tested 5,000 school children between the ages of 6 and 16 years. The amount of albumin secreted was measured in each case. Albumin was found in 6.7 per cent. of the younger children, while in the elder children between 15 and 16, albumin was present in 38 per cent.; in large amounts in 3.2 per cent.

This form of albuminuria cannot be considered as connected with puberty as it occurs at a much earlier age. It is more frequent in girls than in boys, perhaps in part due to the presence of inflammatory products derived from the female sex organs. It would appear that albuminuria appears during the period of greatest growth—prior to the actual time of puberty. "Growth albuminuria" is apparently a physiologic-biologic process, and does not imply renal changes, and it is likely that physiological albuminuria in adults is due to a somewhat similar metabolic process.

C. F. MARTIN

The Etiology and Treatment of the So-called Functional Psychoses. Cotton, H. A.: *Amer. Jour. of Psychiatry.*, Oct., 1922.

The author deals with his experience in the treatment of these psychoses by detoxication. For the past four years, he has paid special attention to the removal of foci of infection from the functional psychotics at the Trenton State Hospital.

His observations reveal the fact that these patients readily harbour multiple foci of infection, most of all in the teeth. The routine in

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this hospital includes a very thorough search for foci of infection; the teeth and tonsils are removed, and an autogenous vaccine is sometimes given from the bacteria isolated from the stomach contents. Streptococci and colon bacilli are the organisms most habitually found. The female patients' gynaecological conditions are thoroughly investigated; while in many cases, both male and female, the lower intestinal tract is carefully investigated for possible lesions.

During the past year 1,400 patients have been remarkably benefited, and the recoveries average 80 per cent. of the group of patients discharged as improved. These results are in striking contrast to those of a previous decade, when the average of improvement was 37 per cent.

C. F. MARTIN

Damaged Lungs and Bronchiectasis. Riviere, C.: *British Medical Journal*, Jan. 27, 1923.

The author, a well-known authority on diseases of the chest, draws attention in this article to the slight but common forms of bronchiectasis which result from previous affections of the lung. These results he gathers together under the term "damaged lung." He does not concern himself with those uncommon cases of bronchiectasis, described fully in textbooks, with "pints of fetid pus which separates into three layers."

Mild cases of bronchiectasis plus more or less fibrosis often present very anomalous signs difficult of interpretation and are not infrequently diagnosed as cases of pulmonary tuberculosis. They are understood when it is realized that any inflammation of the lung, no matter how slight, may leave behind it a little permanent damage: the lung tissue, air tubes, and pleura do not return to *statu quo* and a mild grade of fibrosis, bronchiectasis, or more frequently bronchiolectasis remains.

Clive Riviere groups his cases into two classes (1) those seen in childhood, and (2) those in adult life. Bronchiectasis or bronchiolectasis may follow simple bronchopneumonia, or that accompanying whooping cough or measles; bronchitis, simple or combined with the two diseases mentioned above or with diphtheria; lobar pneumonia and congenital atelectasis; or finally it may follow upon an attack of influenzal pneumonia or pulmonary tuberculosis, for children *may* recover from pulmonary tuberculosis. After bronchopneumonia in a child the signs often do not completely clear up and such children are prone to have other attacks milder in type, an acute catarrh of the dilated bronchioles with no surrounding consolidation, or a fresh bronchopneumonia. A history of previous disease, the mild course in some cases, and the presence of slight clubbing of the fingers may make one suspect that an attack is occurring in lungs already "damaged."

Most of the cases are basal and then tuberculosis is not so closely simulated, but sometimes an area of impairment with crepitations at the right apex is found and it is then necessary to bear in mind that the right upper lobe is the second commonest site of bronchopneumonia in children, the left lower lobe being the commonest. The children are less ill than with tuberculosis of similar extent and the history and course of the disease should help us to distinguish the lesion from that of pulmonary tuberculosis.

"The child is father of the man" and "damaged" lungs in adults are often the result of inflammation occurring when the patient was very young. The author says he has no definite proof to offer, but is of the opinion that "basal bronchitis," strictly confined to the bronchopneumonia area, is bronchiolectasis derived from a bronchopneumonia in childhood which did not resolve completely and left some damage behind it, but little immediate ill health. Such adult patients may even spit up some blood and it is often necessary to inquire of some older relative before one can learn of an attack of bronchopneumonia years before.

Pneumonia in the recent pandemic of influenza was characterized by the amount of damage done to the interstitial or supporting framework of the lung. On healing, scar tissue formed and pulled, this way and that, on the bronchioles, causing some dilatation here, and narrowing of the bronchioles there. Most commonly this occurred at the bases of the lungs, but, at the apex, many cases were diagnosed as "tuberculosis following influenza.' Finally some amount of bronchiectasis unually accompanies chronic pulmonary tuberculosis and crepitations may remain over diseased areas in arrested or healed tuberculosis.

ARCHIBALD MALLOCH

RADIOLOGY

The Rational Attitude Toward the X-Rays in Diagnosing Digestive Diseases. Brown, Thomas R.: *International Clinics*, March, 1923.

The recent death of Röentgen should not make us oblivious to the fact that his epoch-making discovery has been distinctly a two-edged sword in the digestive field. Dr. Thomas R. Brown, of Baltimore, believes that in the case of a great many physicians, the x-rays have consciously or unconsciously persuaded them to be much less thorough in their careful analysis of the case and in their clinical studies, and this, we feel, is very deplorable, because from x-ray studies alone diagnosis should not, and in many cases cannot, be made. It is to Dr. Brown peculiarly distressing to see a diagnosis founded on very careful clinical study of the case overthrown by a few words from a radiologist, who often is untrained clinically and only too frequently has not had a broad experience in reading x-ray plates. While it is obviously easy to fluoroscope a patient and to take x-ray plates, nothing is more difficult than to explain the pictures on the screen, or to interpret the abnormalities of form or position as manifested in the plates. "I would rather," a celebrated Italian internist said recently, "have no x-ray examination in a case than x-ray plates interpreted by anyone other than a master in this field."

To regard the x-ray as the court of last resort in diagnosis is fundamentally wrong except in gross conditions which can, in the majority of cases, be diagnosed just as definitely by other means. Except in such cases the x-ray diagnosis can rarely be definite; it should only suggest various possibilities the probability of which must be dependent upon other features of the case, as determined by careful history taking, a thorough clinical examination, and the use of various special tests. The x-ray is but one of many means of reaching a diagnosis, none of which except in occasional instances, is capable of furnishing the diagnosis *per se*, but each of which should be used in proper proportion in reaching a probable or, in rare instances, an absolute diagnosis. To show the difficulty even in the hands of experts, Dr. Brown suggests the advisability of having the same case studied under exactly the same conditions by various radiologists. In certain cases all will agree on the diagnosis. These, as a rule, are the easy cases, diagnosable by other means; but in a considerable proportion of cases very different diagnoses will be furnished by different men, all honest, all experienced, all capable in this field. The pictures are definite, the images on the screen are definite, but the interpretation always is a question of subjectivity, and must differ unless the picture is perfectly obvious.

PEDIATRICS

Severe Blood Diseases of Childhood. Poynton, Thursfield & Paterson, *British Journal Childrens' Diseases.* April to December, 1922.

After some general remarks on diseases of the hæmopoetic system and methods for their investigation, to which they do not add anything new, the authors express the view that the next advance in the study of these diseases will come through knowledge of the blood serum and its components, rather than from study of the bone marrow reactions. From the leucocytic reaction to infection, either poly- or mono-nuclear, they suggest that the hypothesis of an infected origin for all the anæmias including the leukæmias as that which is most likely to prove fruitful. They divide their cases into five classes:—

(a) Congenital anæmias; alcoholic jaundice and polycythemia.

(b) Severe anæmia gravis (aplastic) and Von Jaksch's anæmia.

(c) Leukæmia.

(d) Simple anæmia of Chlorotic type.

(e) Lymphadenoma.

(f) Purpura.

The symptomatology, diagnosis and treatment of congenital alcoholuric (haemorrhagic) jaundice is discussed and the differential diagnosis and aplastic anæmia and its apparent similarity to the pernicious anæmia of adults described. It differs from pernicious anæmia of adults in the absence of evidence of bone marrow activity as revealed by pathological sections, and in the white colour of the bone marrow, rather than the usual red colour of pernicious anæmia. According to the author's

conception of this disease, it is secondary to some blood poison, infective or otherwise, and from lack of demonstrable cause it is called a primary anæmia.

These workers consider Von Jaksch's anæmia to be a separate clinical entity rather than a severe stage of any infantile anæmia. They require for the diagnosis that the child be under the age of four years, that the anæmia should be severe, that there should be an unusual proportion of myelocytes present in the peripheral blood, and that the spleen should be of considerable size.

These clinicians make some interesting observations on leukæmia in childhood. They point out that a great increase in the total number of white cells in lymphatic leukæmia was the exception rather than the rule, although there is a higher percentage than normal of the lymphocytes. There is also one type of leukæmia in which the white cells are much diminished in number, *i.e.* a "leucopenia" which they term leukanæmia or aleukæmic leukæmia. They regard leukæmia as a peculiar reaction on the parts of the organism to infection, not of a specific nature, which may cause a myeloid or lymphatic reaction.

They discuss cases of acute lymphatic leukæmia, myeloid leukæmia, and mixed leukæmia in which the characteristic blood cells of both the recognized types were present in large numbers; and also lymphadenoma, with general glandular, hepatic, and splenic enlargement accompanied by fever, of, at times, a continuous, later an intermittent type, and a chlorotic type of anæmia in children, which resembles the usual adult picture in the rapid reaction to iron and arsenic.

They conclude that any sharp distinction between myeloid and lymphocytic leukæmia in childhood becomes impossible and further there are unusual cases in which the resemblance to aplastic anæmia and purpura hæmorrhagica is clinically very close. Many severe cases of lymphatic leukæmia show little or no glandular enlargement and little enlargement of the spleen. The cases reported are in children from four months to twelve years of age. The younger the onset the more rapid the course.

These authors report on ten cases of purpura in this article. They divide them into three groups:—

(1) Purpura hæmorrhagica—is the most severe and is associated with internal and external hæmorrhages and high fever.

(2) "Henoch's" purpura is characterized by sudden and recurrent attacks of abdominal pain which may be of great severity .

(3) Cases in which there are subcutaneous hæmorrhages with little or no constitutional disturbance.

These groups cannot be sharply divided, but merge into one another.

The value of rest and warmth in treatment is emphasized. The search for local foci of infection was of little assistance. Special diets have helped only in chlorosis and secondary anæmias. Untoward results from transfusion with citrated blood in two cases, one of aplastic anæmia and one a purpura hæmorrhagica, have caused these workers to abandon this procedure in anæmia gravis, leukanæmia, and purpura hemorrhagica. Splenectomy is advised for alcoholuric jaundice. R. R. STRUTHERS

SURGERY

Lymphaticostomy in Peritonitis. Costain, W. A.: *Surg. Gyn. and Obs.*, Vol. 36, p. 365.

The author has published in a previous article results of experimental work on dogs to show that there is in general peritonitis, fatal absorption through the thoracic duct. In later experiments on dogs, where general peritonitis was produced by ligating the appendix and meso-appendix, the thoracic duct was opened in the neck and drained, resulting in complete recovery of most of the animals.

Later he reports a case of general pneumococcal peritonitis in a child of nine years where the thoracic duct was drained at the neck. The pus in the abdominal cavity disappeared without abdominal drainage and the child made a complete recovery.

His conclusions are: (1) That there is a fatal absorption through the thoracic duct. (2) The elimination of toxin or bacterial absorption from the peritoneal cavity and lumen of the lower bowel cuts short those symptoms which are commonly observed in post-operative peritonitis. (3) The peritoneal cavity has wonderful ability to deal with inflammatory processes when not hampered by absorption. (4) Lymphaticostomy is not in itself a dangerous operation. B. F. MACNAUGHTON

Post-Operative Pulmonary Complications. Cooke, Chas. O. and Pickles, Wilfred.: *The Rhode Island Medical Journal*, Feb., 1923.

This paper is based on a study of 1,000 operations. Thirty-nine cases developed some form of pulmonary complication afterwards. There were fourteen cases of simple bronchitis. In five of these the wound was septic. There were eleven cases of bronchopneumonia of which six were associated with septic wounds. Of the eleven three died, all septic cases. Lobar pneumonia occurred in five patients. It began on the second or third day after operation. Three cases were fatal, all being septic before operation. There were four cases of pulmonary infarction marked by sudden onset, fever, rapid pulse and respiration. There were two cases of lung abscess. Both followed abdominal operations. Hypostatic pneumonia followed two cases of prostatectomy. One in which only local anaesthesia was used was fatal. There were two cases, one of bronchopneumonia and one of lobar pneumonia after the use of nitrous oxide gas and oxygen. Thirty-one of these cases of pulmonary complications followed operations on the abdomen.

There are two principal theories as to the cause of these complications. The first ascribes them to the aspiration of foreign matter into the lung; the second to embolism from the field of operation. The writer thinks that the evidence is in favour of the second theory. He thinks that the number of these complications can be lessened by (1) a reduction in the amount of trauma at the operation, (2) accurate haemostasis, (3) careful control of sepsis, (4) great caution in operating on patients with demonstrable pulmonary disease.

W. B. HOWELL

COMMITTEE IN CHARGE OF THE FORTY-THIRD ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION

Chairman—DR. E. R. SECORD, Brantford.
Secretary—DR. T. C. ROUTLEY, Toronto.

Vice-Chairman—DR. P. A. DEWAR, Windsor.
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Section of Radiology:
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DR. R. E. HOLMES, Windsor, Secretary.

Section of Pathology and Laboratory Methods:
DR. S. M. ASSELSTINE, Windsor, Chairman.
DR. H. H. LEES, Windsor, Secretary.
DR. THORNE, Windsor.

Committee on Arrangements:
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DRS. FRANK ADAMS; BROCKENSHIRE, LANSPEARY, MOODY, WILEY.

Committee on Publicity:
DR. JAS. M. YOUNG, Walkerville, Chairman.

Committee on Entertainment:
DR. H. R. CASGRAIN, Windsor, Chairman.
DRS. CRUICKSHANK, FRED ADAMS, LITTLE, LAING, ST. PIERRE, ROBSON.

XUM

THE PRELIMINARY PROGRAMME FOR THE FORTY-THIRD ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION, TO BE HELD IN WINDSOR ON May 29, 30, 31 and June 1, 1923

GENERAL NOTES REGARDING THE MEETING

Not since the year 1896 have the City of Windsor and her neighbouring municipalities had the honour of entertaining the O.M.A., and now after a lapse of twenty-seven years the Border Cities, an enterprising and growing centre of industry with ambitions of doubling her population in the next ten years, is delighted to welcome once more the Association. The older members of the profession still in practice, will recall with considerable glee and humour, the former meeting of the Association and the good times they enjoyed at that memorable meet. Your Entertainment Committee under the able direction of Col. H. B. Casgrain, who had command of the entertainment of the last O.M.A. meeting held in Windsor, are planning to excel themselves in making your visit most happy and enjoyable.

Excellent arrangements have been made for golf and tennis enthusiasts. Tournaments in golf will be held at the Essex, Beach Grove and Ste. Clair Clubs. The Elmcourt and Walkerville Tennis Clubs will be available.

The Committee on Arrangements reports that splendid accommodation will be available for all out of town guests. Reservations may be made through the Prince Edward Hotel, Windsor. Write the Manager direct, and do so as soon as convenient.

The Round Table Dinner will be held on Tuesday, May 29th, at 7.00 p.m., in the new Prince Edward Hotel. All members of the Association are cordially invited. This function has become, during the past three years, one of the most interesting features of our meetings. The report of the Committee on Interrelations will again form the basis of discussion for this year. A real interesting programme is assured. In order that we may set a place for every one each member should advise Dr. Morand, Allen Theatre Building, Windsor, if he hopes to be present.

ROTUNDA OF PRINCE EDWARD HOTEL. THE HEADQUARTERS FOR THE MEETING

The Association Dinner, to which the ladies are invited, will take place in the hotel on Wednesday at 7.00 o'clock. This is the one big get-together function of the meeting. Last year the attendance was close upon four hundred. Let us make it five hundred this year. The members of the Association are getting to know each

other better. On this occasion, the ladies are the honoured guests. It is hoped they will be present in large numbers. The programme promises to be most entertaining—with some surprises, too. Plan to be there.

On Thursday evening, the graduates of Toronto, Queen's, McGill and Western are to be entertained at the different clubs. Dr. P. A. Dewar will entertain the graduates of Toronto at Essex County Club; while Dr. J. M. Young has extended an invitation to all Queen's graduates to an entertainment at the Walkerville Tennis Club. The Western and McGill graduates are planning reunions.

The Association and its friends are to be the guests of Parke, Davis & Co., at a boat trip, on Thursday, at 4.00 p.m., when refreshments and entertainment will be provided.

Have all mail, telegrams and long distance messages addressed in care of the Secretary of the Ontario Medical Association, Prince Edward Hotel, Windsor, Ont.

Information regarding the parking of cars will be available at the Registration Office.

Green Cross Markers will be available for all motorists. Members are urged to put them up and thus identify themselves among their colleagues.

X-Ray View Boxes will be installed in the Radiological Section. If any one has an interesting plate which he would like others to see, the committee will be glad to have him bring it to the meeting.

The members of the Committee in charge of the Annual Meeting (whose names are herewith presented) and the members of the Essex County Medical Society, under whose auspices the meeting takes place this year, will be glad to do all in their power to make the time of all interesting and profitable while at the meeting. They are prepared to answer all questions about any matter in which they can be of service.

Write the Secretary for any information which is not given in this Preliminary Programme.

NOTE—Informal dress on all occasions

PROGRAMME

Tuesday, May 29th

9.00 a.m.—Meeting of Directors, in Parlor B, Prince Edward Hotel.

11.00 a.m.—Meeting of Committee on General Purposes, which, with adjournment for luncheon, will continue throughout the afternoon. (Parlor B, Prince Edward Hotel.)

7.00 p.m.—Round Table Dinner, Banquet Hall, Prince Edward Hotel.

8.00 p.m.—Round Table Discussion. (Interrelations Committee Report).

Wednesday, May 30th

9.00 a.m.—Registration. (St. Alphonsus Hall).

10.00 a.m.—Business Session of the Association, in Auditorium. (St. Alphonsus Hall)

11.30 a.m.—Address in Surgery—Dr. L. J. Austin, Queen's University.

12.30 p.m.—Luncheon, Prince Edward Hotel. Ladies invited. Hosts—The Rotary Club.

An address will be given on "Crippled Children," by Dr. D. E. Robertson, Toronto.

2.00 p.m.—Sectional Meetings.
Joint Meeting of Medicine, Surgery, Paediatrics and X-Ray.—Symposium on Thyroid, in Auditorium.

5.00 p.m.—Motor Drive along the Banks of the Detroit River.

7.00 p.m.—Association Dinner, Prince Edward Hotel. Ladies invited.
Presidential address—Dr. E. R. Secord, Brantford.

Thursday, May 31st

9.00 a.m.—Sectional Meetings.

11.15 a.m.—General Business Session.

11.30 a.m.—Address in Medicine—Dr. F. G. Banting, Toronto.

12.30 p.m.—Luncheon. Hosts—Chamber of Commerce.

2.00 p.m.—General Session in charge of Department of Pathology, Rooms A., B., and C., St. Alphonsus Hall.

3.30 p.m.—Boat Ride—as guests of Parke, Davis & Co., (entertainment, dancing and refreshments).

8.00 p.m.—Class Reunions.

(Write Dr. Morand, *re* reservations).
(Allen Theatre Bldg, Windsor).

Friday, June 1st

9.00 a.m.—Sectional Meetings.

11.15 a.m.—General Business Session.

11.30 a.m.—Address in Gynaecology—Dr. F. W. Marlow, Toronto.

12.30 a.m.—Adjournment for Luncheon.

2.00 p.m.—Sectional Meetings.

XUM

SECTIONAL PROGRAMME

EYE, EAR, NOSE AND THROAT

Wednesday, May 30th

9.00 a.m.—In Parlor A., Prince Edward Hotel.
Glaucoma—Dr. Walter Parker, Ann Arbor, Mich.

Extraction of Foreign Bodies from within the Eyeball—Dr. D. M. Campbell, Detroit, Mich.

Hoarseness and its Relation to General Medicine—Dr. Perry Goldsmith, Toronto.

2.00 p.m.—Clinical Significance of Vertigo—Dr. Staunton Wishart, Toronto.

Radical *vs.* Intra-nasal treatment of Chronic Nasal Sinusitis—Dr. Jack Hunt, London

Indications of Operations in Chronic Middle Ear—Dr. Howard Burnham, Toronto.

Asthmas associated with Nasal conditions—Dr. J. C. Calhoun, Toronto.

MEDICINE

Wednesday, May 30th, 2.00 p.m.

Joint Session with Surgery, Gynaecology and Obstetrics in Auditorium, (St. Alphonsus Hall).

SYMPOSIUM ON THYROID

Thursday, May 31st, 9.00 a.m.

Pituitary Body—Dr. H. B. Anderson, Toronto.

Vertigo and its significance as a symptom in systemic disease—Dr. R. S. Pentecost, Toronto.

Advanced Myocardial Disease—Dr. John MacGregor, London.

Thursday, May 31st, 2.00 p.m.

Joint session with whole convention under Section of Pathology, in Rooms A., B. and C., St. Alphonsus Hall.

Friday, June 1st, 9.00 a.m.

Joint session with Section of Surgery—Differential Diagnosis of Diseases of Upper Abdomen.

Friday, June 1st, 2.00 p.m.

Comments on some Cases of Septicaemia—Dr. Harris McPhedran, Toronto.

Radium—Dr. W. H. B. Aikins, Toronto.

Practical Value of Non-surgical Biliary Drainage—Dr. F. B. Bowman, Hamilton.

X-Ray Treatment in Dermatology—Dr. W. R. Jaffrey, Hamilton.

OBSTETRICS AND GYNÆCOLOGY

Thursday, May 31st, 9.00 a.m.

The Obstetrical Causes and Treatment of Still Birth and early Infant Mortality—Dr. W. G. Cosbie, Toronto.

Haemorrhages of Pregnancy—Dr. Robert Ferguson, London.

Toxaemias of Pregnancy—Dr. John Bell, Detroit, Mich. Discussion opened by Dr. Van Wyck, Toronto.

Thursday, May 31st, 2.00 p.m.

Joint Session of Convention under Section of Pathology.

Friday, June 1st, 9.00 a.m.

Uterine Haemorrhages—X-ray *vs.* Surgical Treatment—Dr. Donald M. Low, Toronto.

Preventative Gynaecology—Dr. W. P. Tew, London.

The use of Radium in Gynaecology—Dr. G. S. Cameron, Peterborough.

Friday, June 1st, 2.00 p.m.

Papillary Cyst-adenoma of Ovary—Dr. Geo. Hooper, Ottawa.

Caesarian Section—Indications, precautions and technique—Dr. G. G. Copeland, Toronto.

PÆDIATRICS

Friday, June 1st, 9.00 a.m.

Feeding Problems of Older Children—Dr. Alton Goldbloom, Montreal.

Rickets—Dr. F. F. Tisdall, Toronto.

Insulin Treatment of Diabetes in Children—Dr. Gladys Boyd, Toronto.

Friday, June 1st, 2.00 p.m.

Acute Intestinal Intoxication—Dr. H. S. Little, London.

Heart Disease in Children—Dr. A. P. Hart, Toronto.

Treatment and Management of Eczema in infants—Dr. Alan Brown, Toronto.

PATHOLOGY AND CLINICAL LABORATORY METHODS

Thursday, May 31st, 2.00 p.m.

Joint meeting of Convention.

The various Sections will be in charge of: Dr. Reed, Kingston; Dr. Morse, Detroit; Dr. Detweiler, Toronto; Dr. Bullard, Kingston, and Dr. Rhea, Montreal.

RADIOLOGY

This section is under the auspices of the Ontario Radiological Society, this being the third annual session of the Society.

Wednesday, May 30th

1.30 p.m.—Some X-ray problems of the general practitioner—Dr. Frank P. Lloyd, Cobourg.

2.00 p.m.—Mechanical Compensation in Pulmonary Diseases—Dr. Bruce Hopkins, Kingston.

2.30 p.m.—Total Effects of X-ray on Growing Animals—Drs. McKibbon and H. E. Schaef, London.

3.00 p.m.—Diverticulae of Gastro-Intestinal Tract—Dr. W. H. Dickson, Toronto.

Thursday, May 31st

9.30 a.m.—Cancer of the Breast considered from the standpoint of Deep Therapy and Surgery—Dr. Rollin H. Stevens, Detroit, Mich., (by invitation).

Bilateral Pyelography with Lantern Slides—Dr. A. I. Willinsky, Toronto.

Condensation of Bone—Dr. A. H. Rolph, Toronto.

1.30 p.m.—X-ray examination of the Heart—Dr. A. W. Crane, Kalamazoo, Mich., (by invitation).

Treatment of Menorrhagia—Dr. Harold Tovell, Toronto.

7 30 p.m.—Annual Dinner of Ontario Radiological Society, followed by lantern slide demonstration.

Friday, June 1st, 9.30 a.m.

The Significance of Appendical Stasis as demonstrated by the Barium Meal—Dr. W. A. Evans, Detroit, Mich., (by invitation).

SYMPOSIUM ON SARCOMA

(A) X-ray Diagnosis of Sarcoma of Bone—Dr. L. R. Hess, Hamilton.

(B) Results of Treatment of Sarcoma by X-ray—Dr. G. E Richards, Toronto.

(C) Results of Treatment of Sarcoma by Radium—Dr. W. H. B. Aikins, Toronto.

Discussion to be opened by Drs. L. R. Hess and E. S. Hicks, Hamilton and Brantford.

SURGERY

Wednesday, May 30th, 2.00 p.m.

SYMPOSIUM ON THE THYROID—JOINT SESSION

Pathology of the Thyroid—Dr. Jas. Miller, Kingston.

The medical phase of the thyroid—Dr. W. T. Connell, Kingston.

The surgical phase of the thyroid—Dr. A. Moir, Peterboro.

X-rays and Radium in the treatment of Thyroid conditions—Dr. G. E. Richards, Toronto.

Discussion opened by Dr. J. K. McGregor, Hamilton, Dr. Geo. S. Young, Toronto.

Thursday, May 31st, 9.00 a.m.

Cancer of the Breast—Dr. Wallace Scott, Toronto.

Discussion opened by Dr. W. J. Stevenson, London.

Osteomyelitis—Dr. A. B. LeMesurier, Toronto.

Thrombosis and Embolism—Dr. Angus McLean, Detroit, Mich.

Rectal Fistulae—Dr. A. S. Moorehead, Toronto.

Discussion opened by Dr. Hirchman, Detroit.

Thursday, May 31st, 2.00 p.m.

Joint session under the section of Pathology.

Dr. Rhea, Montreal; Dr. Morse, Detroit, Mich.: Dr. Detweiler, Toronto; Dr. Bullard, London; Dr. Reed, Kingston.

Friday, June 1st, 9.00 a.m.

Joint session with Section of Medicine.

Differential Diagnosis of Diseases of the Upper Abdomen:

(a) Stomach and Duodenum—Dr. H. Bruce, Toronto. Discussion opened by Dr. W. J. Cassidy, Detroit, Mich.

(b) Biliary Passages and Pancreas—Dr. Bevan, Chicago.

Discussion opened by Dr. Angus McLean, Detroit, Mich.

(c) Kidneys and Spleen—Dr. Roscoe Graham, Toronto.

Discussion opened by Dr. R. J. McComb, Toronto.

(d) Ileum, Jejunum and Colon—Dr. E. A. Archibald, Montreal.

Discussion opened by Dr. Geo. Wilson, Toronto.

Friday, June 1st, 2.00 p.m.

Manifestations of General Septicaemia—Dr. Norman B. Gwyn, Toronto.

The Diagnosis and Treatment of Bladder Lesions.—Dr. C. H. Gilmour, Toronto.

XUM

News Items

GENERAL NEWS

TYPHOID FEVER AT COCHRANE

THE typhoid fever epidemic at Cochrane, from the information in our possession, would appear to be directly caused by pollution of the town's water supply. The recognized source of supply for the town is from springs. Unfortunately the springs do not yield enough water for the town's requirements, and are quite inadequate to take care of any unusual demand such as a fire. In order to provide for such a contingency the pumps are also connected to Spring Lake, which is an overflow from the springs, but which in addition has a small catchment area of its own. At ordinary times the water level in Spring Lake is several feet higher than the adjacent chain of lakes, which receive the sewerage from the town, but which have a common outlet with that of Spring Lake. Spring Lake and one of these lakes receiving sewerage is connected by a marshy area, through which was cut some years ago a channel to provide an overflow for Spring Lake into the other. During the dry season last fall, and during last winter, the springs proved inadequate to meet the demands of the town, and a considerable amount of water was taken from Spring Lake, with the result that the level of this lake was lowered appreciably, and at the time of the outbreak it was found to be three feet lower than the adjoining lake. At this time it was found that the connection between the two lakes had reversed the direction of flow, and that sewage was actually entering Spring Lake from what had served in former times as an outlet to this lake, the level of Spring Lake apparently having, during the season, altered by nearly six feet, and instead of being 3 feet higher than the adjoining lakes was now lower.

During the summer seasons of 1921 and 1922 the Board had several officers in Cochrane on one purpose and another, and the question of the inadequacy of the present spring supply was urged upon the town. As a result of the Board's warning the town gave its first reading to a by-law on August 1st of last year, providing for an improvement of the spring supply, and for sewage disposal. Unfortunately, the town did not pursue the matter, and the season passed without anything further being accomplished. The Board repeated in its report of November 25th, 1921, the need of a reservoir to store a supply of spring water, and the need of chlorination equipment in connection with the pumping works, so that the supply from Spring Lake could at all times be treated. On March 3rd, 1922, the Board forwarded a copy of its report of November 25th, and urged the immedite purchase and installation of a chlorination equipment.

The provincial sanitary engineer was in Cochrane on Sunday, March 11th, 1923, some days before the outbreak was known to exist. At that time there were some reported cases of diarrhoea arising in Cochrane, although it was difficult to determine from the diagnosis whether this was the diarrhoea of typhoid, or some manifestation of the "flu" epidemic, which was also present at that time. In order to make doubly sure of the water supply, the provincial sanitary engineer called a meeting of the Council on Sunday afternoon, and told them that in view of the situation it would be imperative for the town immediately to install a chlorination device, and after the meeting the provincial sanitary engineer wired one of the Board's engineers to borrow an equipment from the Wallace & Tiernan Company, and to bring it up on Tuesday, and install it as soon as possible. The Tuesday train did not arrive until late Wednesday evening, and it was not until a few days later that the town recognized that they were suffering from an outbreak of typhoid fever. If the pumping engineer had been fully aware of the situation he might have scented danger when he saw the level of Spring Lake dropping in his pump-well. The blanket of ice and snow over the whole area, however, concealed what was taking place. In addition to the equipment by our engineer, another machine was despatched last week to take care of the treatment of an auxiliary supply, which the town was proposing to obtain from Norman Lake. I understand, however, that the lowering of the level of Norman Lake within the last few days has necessitated the abandonment of this supply. The Board, through a request to a local engineer in the municipality for information *re* direction of flow in outlet connection of Spring Lake, was the first body to point out the manner in which the supply had become contaminated. Up till midnight of the 3rd of April there have been 600 cases of typhoid fever with 12 deaths.

The Board has sent to Cochrane on the Mayor's request *two physicians, 46 general nurses,* and 10 of our own public health nurses. The latter are carrying on scout and preventative measures among the people, general nursing in emergencies, looking after young children where mothers are ill, and making themselves generally useful. We had four of these nurses in Cochrane for the first ten days and, upon the Mayor's request, and statement that they were doing most valuable work, six more have been sent forward. Miss Knox, Associate Director of the Division, has been on the ground most of the time, and the district officer for North Bay has been there almost continuously.

There is a well equipped emergency hospital of 72 beds on the three floors of Columbus Hall, and a convalescent home has been established next door. The work in Cochrane is in the hands of a very competent local committee, who, I am advised, are doing excellent service. I am in touch with the Mayor by telephone almost every day, and he has been told to advise me of anything he needs. He has expressed his appreciation of the work we have done. The Red Cross has offered assistance, and this information has been conveyed to the Mayor, who is to advise me if they need anything the Society can afford. The fact that a polluted water supply has been shown to be the cause of this severe outbreak of typhoid fever, and that the Council had neglected repeated warnings of the Board in this respect, places a very grave responsibility upon the local corporation.—J. W. F. McCULLOCH, *Chief Officer of Health, Ontario.*

DEATHS FROM TYPHOID FEVER AND RATES IN THE PROVINCE OF ONTARIO

Year	*Deaths No. of*	*Rate*	*Year*	*Deaths No. of*	*Rate*
1902	392	17.7	1912	483	18.8
1903	391	17.3	1913	446	17.1
1904	482	21.0	1914	358	13.5
1905	446	19.2	1915	298	11.1
1906	891	37.8	1916	335	12.3
1907	520	21.8	1917	252	9.1
1908	662	27.3	1918	208	7.4
1909	669	27.2	1919	145	5.0
1910	706	28.4	1920	203	7.0
1911	637	25.2	1921	213	7.2

CANADIAN SOCIETY FOR THE STUDY OF DISEASES OF CHILDREN

The first Annual Session of the Canadian Society for the Study of Diseases of Children will take place in Montreal in the Mount Royal Hotel June 15th and 16th immediately following the meeting of the Canadian Medical Association. The following papers have already been promised: Acute Intestinal Intoxication by Alan Brown and Gladys Boyd. Acute Hæmorrhagic Pancreatitis, case report, by Alan Brown. Some Phases of Pneumonia by Geo. Campbell. The Diagnosis and Treatment of Laryngeal Diphtheria by H. B. Cushing. Some Unusual Feeding Problems by Alton Goldbloom. Nutritional Oedema by L. M. Lindsay. "Acrodynia" by Crossan Clarke.

The fourteenth meeting of the Montreal Medico-Chirurgical Society was held in the Children's Memorial Hospital, 45 Cedar Avenue, on the evening of April 20th. The following papers or cases, among several others, were presented: Food Oedema by Lionel M. Lindsay; Use of X-ray in the Treatment of Whooping Cough by R. R. Struthers and Norman I. Williamson. Operation for Chronic Empyæma, with presentation of a case by Fraser B. Gurd. Experience with the Open Air Treatment of Disease by A. MacKenzie Forbes. Subcutaneous Irbroid Nodules in Articular Rheumatism, presentation of case and lantern slide Demonstration by H. B. Cushing. Hodgkin's Disease in a young Child by H. B. Cushing. Observations on Rickets by Alton Goldbloom.

The American Medical Association Convention will be held in San Francisco from June 25th to June 29th, 1923. The California State Medical Association meets there also on the previous Friday and Saturday and some five or six other National and District Medical Associations have arranged to hold their meetings in San Francisco between June 21st and June 30th. It is thought that many physicians might like to make a holiday trip of it and cross the continent by motor; arrangements are being made for a number of automobile caravans to start from points in the East. The Committee of Arrangements has planned many trips for the visitors who wish to see the natural beauties of mountain, valley, or sea-coast or the evidence that remains of the Spanish regime. Visitors are urged to enter and leave California by different routes so that as much variety as possible in scenery may be witnessed. More extensive trips for those wishing them are suggested: (1) "Twenty-one days to Hawaii and return,"; (2) "Twenty-four day cruise to Alaska,"; (3) "Three weeks' National Park Trip,"; and (4,) "Four weeks in the Canadian Rockies." All inquiries about the Convention, railroad, and other arrangements should be made to Dr. W. E. Musgrave, CaliforniaH eadquarters, 1923 American Medical Association Convention, 806-9 Balboa Building, San Francisco, Cal.

Labour and Doctors.—Organized labour in Toronto has been making representations to the University Committee, of the legislative assembly of Ontario with respect to the qualifications which medical students should have before they are granted a doctor's certificate. The memorial urges that after graduation medical students should go through some form of apprenticeship. It also urges the opening of all public hospital wards to all doctors who have taken a post-graduate course. The memorial also calls for some system to be devised to keep check on the work being done by physicians, so that the doctor who is generally successful may be distinguished from the doctor whose record of mortality is high. "The medical profession," so runs the memorial, "is about the only one which can bury its mistakes." Such are the ideas of labour men regarding the medical profession.

Physical Training For The Young.—Dr. Lamb has done well to emphasize the need of a more general and more scientific physical training of school children. Sixty per-cent. of Canadian recruits during the late war, he declared, were unfit through lack of physical training in early childhood. Figures such as these shake the foundations of our training system. He justly condemned university methods in which a few athletes are especially developed at the expense of the mass of students. So long as gate-money is regarded as the most important issue in amateur athletics, the universities are not likely to have room for the development of more than one or two highly trained teams. The necessity of coordinating physical and mental education in order to obtain the increase in general efficiency resulting from bodily health appears to be insufficiently appreciated. Greek culture, which has stood as an example for all time, was developed from the gymnasium. Originally intended for the exercise and training of those competing in the public games, gymnasium became consequently the headquarters of medical institutions and philosophic schools; all-round attainments were highly prized and intellectual development was regarded as dependent on bodily well-being. G.H.

NOVA SCOTIA

ANNOUNCEMENT has just been made by Dr. Jost, Provincial Health Officer, of the Appointment of Dr. P. S. Campbell, of Port Hood, as Divisional Medical Officer in the Department of Public Health. Dr. Campbell has frequently contributed papers at the annual meetings of the Health Officers' Association of this province, and has for a number of years followed details of public health administration as a close student. He has had an unusual foundation for public health work and is a valuable addition to Dr. Jost's staff.

AN outbreak of small-pox has been reported to the Department of Public Health in an isolated part of Victoria County, a section of the province without railway, and even without mail communication for a good part of last winter. The infection is said to have been introduced by a man returning from a lumber camp in Maine.

NOVA SCOTIA citizens were given an interesting series of addresses on social hygiene by Mrs. Emmeline Pankhurst during the week beginning April 8th. On Sunday afternoon and evening, mass meetings were held in the Casino Theatre and in the Assembly Hall of the Navy League Building. At the former, Dr. Royer as Chairman, Col. Jos. Hayes and Col. H. A. Chisholm made brief medical references on the subject of venereal diseases. Mrs. Pankhurst followed with an able address. At the evening meeting, Premier Armstrong presided, and made the introductory address, and was followed by Col. Chisholm, after which Mrs. Pankhurst held the attention

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of the audience for nearly an hour. On the morning of the 9th, Mrs. Pankhurst addressed the Ministerial Association: and in the afternoon a mass meeting for women in the Y.M.C.A., the hall being filled to the limit of standing room. Later, after the election of officers, Mrs. Pankhurst addressed the Social Hygiene Council. The newly elected officers of the Council are: Hon. President, Lieutenant-Governor Grant; President, Col. Joseph Hayes; Vice-Presidents, Mrs. A. I. Mader, Col. E. C. Phinney, Mrs. Pentz; Executive, the above and Mr. J. D. O'Connor, Dr. A. H. MacKay, Dr. B. F. Royer; Secretary-Treasurer, Dr. H. A. Chisholm. Mrs. Pankhurst addressed meetings at New Glasgow, Sydney and Amherst, Col. Chisholm making the preliminary addresses. Remarks on every hand showed the wisdom of bringing this well-trained public speaker to discuss the subject of social hygiene with mixed and special audiences.

THE Faculty of Dentistry at Dalhousie University have accepted the offer of the pre-school age dental clinic at the health centre to have the senior dental students study the work of the paedodontist at her clinics conducted three mornings a week in old Admiralty House.

DR. LYONS who has been associated with Dr. Alan Curry at the posture clinic at the health centre, will develop a clinic dealing with remedial defects, and will also undertake to guide the public health nurses in re-educating the children from whom diseased tonsils and adenoids have been removed, teaching and demonstrating right methods of breathing, correct carriage, etc.

IN March the public health nurses and visiting housekeepers from the various health centre clinics of the Massachusetts-Halifax Health commission made thirty-one hundred and eighty-two visits into a total of twenty hundred and eighty homes. At the clinics some eight hundred and eighty-eight medical and nursing consultations were sought, one hundred and nineteen of them being first visits. Seven of the nurses gave addresses on personal hygiene to various groups of the C.G.I.T., while the executive officer addressed the Gyro and Aurora Clubs, the Engineering Society and Boy Scouts, showing the decline in death rates in recent years.

THE annual banquet of the Halifax Medical Society was held at the Carleton Hotel, April 18th. The officers elected for the ensuing year are as follows: President, Dr. M. G. Burris; Vice-President, Dr. E. V. Hogan; Secretary-Treasurer, Dr. S. J. Turel; Executive, Dr. J. R. Corston, Dr. Angus McDonald Morton, Dr. F. R. Little, Dr. H. G. Grant and Dr. Kenneth A. MacKenzie.

B. F. R.

QUEBEC

Dr. Couillard, director of Lake Edward Sanatorium, gave an interesting lecture on tuberculosis to his Chicoutimi friends.

Dr. A. Ethier, of Montreal, has just returned from a three months' trip to Europe.

Dr. A. Rousseau, Professor of Laval University, is about to leave for a trip to Europe.

Dr. E. Tremblay, of Baie St. Paul, is sojourning in Switzerland; he will visit France, Belgium and Holland.

Dr. J. Benjamin Blouin, Quebec, passed away in March, at the age of 77 years and 5 months.

The Annual Meeting of the *Alexandra Hospital for Infectious Diseases* took place April 11th in the board room of the Bank of Montreal. One thousand two hundred and fifty-three patients were treated during the past year. Of these sixty-eight died. Of those who died, twenty-three were practically hopeless when admitted. Excluding these the mortality for the year was only forty-five deaths, slightly higher than the percentage of the previous year, owing to the severity of the cases of scarlet fever admitted during the early months of the year. During the past year many improvements have been made in the hospital. A central heating plant has been put in and the laundry has been fully equipped to enable it to undertake the increasing work. Two of the wards had been equipped with cubicles, each cubicle furnished with running water and everything necessary for nursing. The financial report showed a heavy deficit owing to the lessened revenue from the city and the increased expenses of the nursing staff.

The report of the *Montreal Maternity Hospital* showed that 1,378 patients had been treated during the year. Of these, 1,239 had been confined and discharged well. Seven had been transferred to other hospitals and ten had died. The main features of the report were the small maternal mortality and low maternal morbidity. Out of 484 viable infants born, 474 were discharged well. Mention was made of the splendid work given by the Paediatric Staff in supervising the treatment of the newborn. Notice was also taken of the pre-natal work carried on in the Hospital.

The medical college and other research buildings of McGill University were visited by a party of Japanese scientists who had been invited to make a tour of the United States and Canada by the Rockefeller Foundation of New York. The party was headed by the Baron Yoshihiro Takaki, chief surgeon and president of the Tokyo Charity Hospital, Dr. Sahachiro Hata, expert in bacteriology and serology, attached to Keio University, and Dr. Keinosuke Miyairi, dean of the medical college of the Imperial University. They expressed themselves as greatly interested in what they had seen and were much impressed with the plans for the new pathological building in the course of erection in close conjunction with the Royal Victoria Hospital.

A Banquet was tendered Dr. Francis J. Shepherd on the evening of the 14th, on the occasion of the fiftieth anniversary of his graduation, by his former demonstrators of anatomy of McGill, and his house surgeons in the Montreal General Hospital. The decorations were carried out in crimson and white, McGill colours. Dr. F. G. Finley, Dr. Shepherd's first Montreal house surgeon, presided. Letters were read from a number of Dr. Shepherd's old assistants and house surgeons, including Dr. Hugh Kinghorn, Saranac Lake; Professor Campbell P. Howard, University of Iowa; Professor Tait McKenzie, University of Pennsylvania; and a cable from

Dr. Ridley Mackenzie, at Paris. Dr. Finley stated that McGill owed a great debt to Dr. Shepherd, who modernized and greatly improved the teaching of anatomy in McGill, so that McGill became recognized as the leading school of anatomy on the continent; in his surgical teaching he brought prominently before his students the practical application of this knowledge. Dr. Bazin, supporting the toast, stated that Dr. Shepherd was not only known as a singularly expert operator, but as a surgeon who had excellent judgment and an almost intuitive power of diagnosis. Reference also was made to the fact that Dr. Shepherd had been associated with the advance of Art in Montreal for almost a generation. He had for a long time been a member of the Council of the Art Association of Montreal, and for several past years been its active President. He was also a member of the Advisory Arts Committee of the National Gallery, in which his critical taste had been of great value to the Committee.

Health Centres in Three Rivers.—Health centres, comprising clinics for tuberculosis and child welfare, will be opened this year at Three Rivers by the Provincial Health authorities providing the necessary co-operation is forthcoming from the town. A grant by the Quebec Government of half a million dollars is to be spent in five years on efforts to lessen the death toll due to tuberculosis and infantile diseases.

Premier Opened Radium Institute.—The new radium laboratory of the University of Montreal, whose existence was made possible by a grant of $100,000 from the Provincial Government, was formally opened by the Hon. L. A. Taschereau, Premier of the Province, who was accompanied by Hon. Athanase David, Provincial Secretary. The inauguration took the form of a meeting, with a demonstration held in the amphitheatre of the University. There was a large attendance of physicians as well as a few lay guests.

Dr. L. J. Rhea, of Montreal, was elected councillor of the Canadian section of the International Association of Medical Museums at the recent session held in Boston. Dr. Maude E. Abbott, of McGill University, was elected Secretary-Treasurer of the Association, with Dr. E. L. Judah, also of Montreal, her first assistant. Papers and discussions on the technique of preserving and mounting medical exhibits occupied the evening session of the convention. Major James Coupal, of Washington, D.C., discussed the Government Exhibit of war specimens, and Dr. E. L. Judah, spoke on special methods of mounting specimens. Dr. Maude E. Abbott, read a paper on the cataloguing of specimens in museums, advocating the decimal system, whereby digits to the right and to the left of the decimal point afford important information on the history of the case. G.H.

ONTARIO

At a meeting of the Norfolk County Medical Society, the following officers were elected: President, Dr. E. W. Zumstein, Delhi; Vice-President, Dr. R. W. Tisdale, Delhi; Secretary-Treasurer, Dr. A. B. Jackson, Simcoe.

The Section of Paediatrics of the Academy of Medicine, Toronto, held a very interesting clinical meeting on Thursday, April 19th, at the Hospital for Sick Children, when the following cases were presented: Spinal Tumour, by W. E. Gallie; Brain Tumour, by Geo. Boyer; Congenital Laryngeal Stridor, by A. P. Hart; Cretinism, by Alan Brown; Thyroid Deficiency, by E. A. Morgan; Exophthalmic Goitre, by M. A. Cox; Xeroderma, by H. A. Dixon; Torticollis, by R. I. Harris; Correction of Deformities following Poliomyelitis, by D. E. Robertson; Lymphatic Leukaemia, by Frank Hassard; Eczematous Ulceration of Cornea, by Chas. MacDougall; Some Aspects of Osteomyelitis, by A. B. LeMesurier.

The Western Ontario Academy of Medicine held its first spring Session on April 7th in the Medical School Auditorium, London, Ont. Dr. L. J. Austin, Professor of Surgery of Queen's University, Kingston, gave an address and clinical talk on the subject of Tuberculosis of the Kidney and Bladder. Dr. A. J. Ochsner, of Chicago, President-Elect of the American College of Surgeons, conducted a clinical demonstration. The cases presented included different Fistulae results of post-operative complications; also a series involving gastro-intestinal diseases. The next meeting will be held April 27th, when Dr. H. S. Plummer will speak on "Diseases of the Thyroid," and Dr. Dean Lewis on "Diagnosis of Bone Lesions." On May 25th, Dr. William Goldie will give an address on "Hypertension," and Dr. Hugh Cabot on "Renal and Bladder Calculi." The aim of the Executive has been to make the meetings international, and have teachers from American and Canadian centres meet on each programme. The interest taken in these meetings is widening in its scope, and there is an ever increasing attendance representing a large part of the Western Peninsula. G. A. R.

BRITISH COLUMBIA

Dr. Cannon has been appointed M.H.O. for Coquitlam.

Dr. Geo. W. Sinclair has removed to New Westminster and commenced practice in that city and in the neighbouring Fraser Mills.

Dr. Bruce Cannon and Dr. Geo. Sinclair have been awarded the medical contract for the Fraser Mills; they follow the late Dr. Robert H. Scott.

Dr. J. A. Sutherland, of Vancouver, B.C., has returned after some months spent in England, during which he devoted his studies chiefly to the subject of Proctology at St. Mark's Hospital.

The last two meetings of the Fraser Valley Medical Society (New Westminster) were particularly interesting. On February 19th, Dr. Manchester gave an interesting paper on Psychotherapy, or "outwitting our nerves." On March 19th, Dr. Pearson, of Vancouver, gave a paper on "Sleeping Sickness."

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After considerable discussion between the Management of the General Hospital and the Vancouver Medical Association, a plan for the re-organization of the staff of the Hospital has been arranged. This Hospital, though open throughout to all practitioners in the city, has a considerable amount of charitable work for which a staff is necessary. It is hoped by this re-organization to secure more co-operation and team work as between the various departments.

The Annual General Meeting of the No. 6 District Medical Society of British Columbia (Vancouver Island) was held at Nanaimo on April 6th, when there was a representative gathering from all parts of the Island. Dr. W. F. Drysdale and Dr. T. J. McPhee were unanimously re-elected for a second term to the offices of President and Secretary, respectively. Dr. A. S. Munro, Dr. W. B. Burnett and Mr. C. J. Fletcher, representing the British Columbia Medical Association, were present. Dr. W. B. Burnett gave an interesting address on "Obstetrics" whilst Dr. A. S. Monro outlined at some length the various activities of the Provincial Association, dealing in detail with the present dispute with the Railway Employees' Medical Associations; and also with the subject of "Mine" Contracts on the Island.

Dr. R. W. Irving, of Kamloops, was asked to address the Vancouver Medical Association on "Tick Paralysis" in human beings, a disease peculiar to the dry belt of the Pacific slope. This particular tick, the Dermacentor Venustus, is also responsible for the production of Rocky Mountain fever, by means, it is said, of a parasite, which affects the tick itself. Many ticks are known to exist on the North American continent, but none save this one produces the peculiar paralytic symptoms. These symptoms are remarkable by reason of their widespread character, the rapidity of their onset, and the speed of reversion, when once the provocative cause is removed. Dr. Irving outlined the life history of this member of the Ixodoidea tick family, and referred to the important work done by Dr. Hadwen, late of the experimental farm at Agassiz, B.C., and by Dr. J. L. Todd, of Montreal. He cited particulars of a number of cases occurring in his own practice and in those of nearby colleagues.

Book Reviews

The Gold Headed Cane—By William MacMichael, M.D. A new edition with an introduction and annotations by George C. Peachey, author of the "History of St. George's Hospital." London: Henry Kimpton, 236 High Holborn.

A fifth edition of this medical classic has appeared edited with introductions and annotations by George C. Peachey. Valuable and interesting as the former editions have been, this one apparently has been able to carry still more information in the numerous annotations which Dr. Peachey has so carefully placed along side those of former editions. The short introduction describes the cane and gives a succinct biography of Radcliffe, Neal, Askew, the two Pitcairns and Baillie; in few introductions is so much told and told so well.

Dr. Peachey's own annotations are distinguished by their being in italics. They are numerous enough to double the value and interest of the publication and add enormously to the pleasure of the reading thereof. He has further ornamented the work by the insertion of six splendid plates. The publishers are to be congratulated upon their part. Excellent paper and clear printing prevail throughout. N. B. G

Practical Handbook on the Diseases of Children—By Bernard Myers, C.M.G., M.D., M.R.C.P. 548 pages, with 61 illustrations. Price, 21s. net. Published by H. K. Lewis & Co., London.

This is a general text book on diseases of children. The author, naturally, is only able to give a brief outline of the conditions. The chapters on feeding and nutritional disturbances are poor and not up to date and many of the feeding schemes recommended would not be successful in this country. The more common diseases of childhood such as rheumatism, chorea and heart disease are well dealt with. On the whole, the author has given a very fair review of the diseases of childhood omitting in many instances a discussion of the general principles which are so essential to the student A. B.

Text Book of Pediatrics—Edited by Professor E. Feer. Translated and edited by Julius Parker Sedgewick, B.S., M.D.; and Carl Ahrendt Scherer, M.D., F.A.C.P. 852 pages, with 262 illustrations. Published by J. B. Lippincott Co., 201 Unity Building, Montreal.

This is a most excellent text book in pediatrics, covering the subject in a most thorough manner. Its great value lies in the collaboration of a number of authors, each being an authority in his own branch of the specialty. The etiology, pathology, symptomatology and treatment are all complete, but as short as compatable with their purpose; in fact the book covers the entire subject of diseases of children as completely as do more bulky volumes. Much has been added to the original German edition due to the collaboration of many excellent American authorities and in this manner each subject has been brought thoroughly up to date. A. B.

Nutrition of Mother and Child—By C. Ulysses Moore, M.D., M.Sc., including menus and recipes by Myrtle J. Ferguson, B.S.; 227 pages with 33 illustrations. Price, $2.00. Published by J. B. Lippincott Co., 201 Unity Building, Montreal.

This excellent book should be well received by students, nurses and social workers, as well as by the mother in the home. It is written clearly in non-scientific language. The author commences with a clear delineation of present day knowledge of nutrition and then proceeds to apply it in a simple, practical fashion, dealing with the diet of the mother during pregnancy and lactation. He discusses in great detail the handling of the breast fed infant. Complete diet lists are given for children of all ages, ending with a discussion of the more common mistakes in the feeding of children. The appendix contains an excellent list of recipes and caloric values. A.B.

I Believe in God and in Evolution—By William W. Keen, M.D., Emeritus Professor of Surgery, Jefferson Medical College, Philadelphia. Second Edition. Philadelphia and London: J. B. Lippincott Company.

To have known Dr. Keen was a privilege of the reviewer, hence it is easy to see in this compelling little booklet the figure and activities of that compact octogenarian, who has been one of the guiding hands of American Surgery for fifty active years. The possibility of a belief both in evolution and in a Creator is carefully led up to by resumes from the author's studies in anatomy and surgery and the text and sermon as delivered to the Crozer Theological College, must surely have helped many a graduating and anxious theologian to a better under-

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standing of the old debate. Small as the booklet is, room is found for illustrations in comparative anatomy and surgical procedure which have shown the anatomical similarity between the brains of man and animals; resemblances in other directions are also shown. Sections are devoted to diseases common to animals and man, and to the meaning of "Vestigia" and other such points. Cleric, lay student, scientist may read Dr. Keen's "Credo" with equanimity, satisfaction and approval, according to their several minds. N. B. G.

Books Received

Smell, Taste, and Allied Senses in the Vertebrates—By G. H. Parker, Sc. D. 192 pages, 37 illustrations. Price, $2.50. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Anaemia, Its Causes and Modern Treatment with a chapter on Neurasthenia. By A. W. Fuller, M.D. 64 pages. Price, 3s.6d. Published by H. K. Lewis & Co., London, 1923.

International Clinics—Volume I, Thirty-third Series, 1923. Edited by Henry W. Cattell, A.M., M.D., with the collaboration of Chas. H. Mayo, M.D. 314 pages, illustrated. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Inflammation in Bones and Joints—By Leonard W. Ely, M.D. 433 pages, with 144 illustrations. Price, $6.00. Published by J. B. Lippincott Company, 201 Unity Building, Montreal.

Bulletin of the Buffalo General Hospital—Published by the Trustees of the Hospital, Buffalo, N.Y. Vol. I, No. 1, January, 1923. pr. 39.

The New Canadianism, An address delivered by Sir Arthur Currie, G.C.M.G., K.C.B., Principal, McGill University, Montreal, at the Eighth Annual Conference of Heads of Canadian Universities, held at Winnipeg, June 16, 1922. Published by the Canadian Club, of Montreal, pp. 9 to 80.

The Heart in Modern Practice, Diagnosis and Treatment. By William Duncan Reid, A.B., M.D. 352 pages with 32 illustrations. Price, $5.00. Published by J. B. Lippincott Company, Montreal.

Rest and Other Things—A little book of plain talks on tuberculosis problems. By Allen K. Krause, A.M., M.D. 159 pages. Price, $1.50. Published by Williams & Wilkins Company, Baltimore, U.S.A., 1923.

Handbook of Sanitary Law, for the use of candidates for public health qualifications. By B. Burnett Ham, M.D., D.P.H., 9th edition, revised by H. R. Kenwood, C.M.G., M.B., D.P.H. 244 pages. Price, 5s. net. Published by H. K. Lewis & Co., London, England.

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